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INSTALLATION RESTORATION PROGRAM. PHASE I. RECORDS SEARCH, HANC--ETC(U)
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INSTALLATION RESTORATION PROGRAM

PHASE I - RECORDS SEARCH

HANCOCK FIELD, NEW YORK

PREPARED FOR

UNITED STATES AIR FORCE
AFESC/DEV
Tyndall AFB, Florida

and

HQ TAC/DEE
Langley AFB, Virginia

ES ENGINEERING-SCIENCE

JULY, 1982

This report has been prepared for the U.S. Air Force by Engineering-Science for the purpose of aiding in the implementation of the Air Force Installation Restoration Program. It is not an endorsement of any product. The views expressed herein are those of the contractor and do no necessarily reflect the official views of the publishing agency, the United States Air Force or the Department of Defense.

INSTALLATION RESTORATION PROGRAM
PHASE 1: RECORDS SEARCH
HANCOCK FIELD, NEW YORK

Prepared For
United States Air Force
AFESC/DEV
Tyndall AFB, Florida

and

HQ TAC/DEE
Langley AFB, Virginia

July, 1982

By
ENGINEERING-SCIENCE, INC.
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Suite 590
Atlanta, Georgia 30329

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9827

July 30, 1982

Mr. Myron Anderson
AFESC/DEVP
Tyndall AFB, Florida 32403

Dear Mr. Anderson:

Enclosed is the Engineering-Science, Inc. (ES) final report entitled "Installation Restoration Program, Phase I, Records Search, Hancock Field, New York." This report has been prepared in accordance with the ES' proposal dated November 13, 1981 and the Air Force Contract number F08637-80-G0009, Call #0014.

Presented in this report are introductory background information on the Installation Restoration Program, a description of the Hancock Field including past activities, mission and environmental settings, a review of industrial activities at Hancock, an inventory of major solid and hazardous waste from past activities, a review of past and present waste handling, treatment and disposal facilities, an evaluation of the pollution potential of waste disposal sites, and recommendations for the Installation Restoration Program, Phase II, Problem Confirmation and Quantification.

Questions concerning this report should be directed to the Hancock Field Public Affairs Officer.

We enjoyed the opportunity to work with you and the Hancock Field personnel who contributed information for the completion of this assessment.

Very truly yours,

ENGINEERING-SCIENCE, INC.

Gary Christopher

W. G. Christopher, P.E.
Project Manager

WGC/amr

Enclosure

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Department of Defense (DOD) has developed a program to identify and evaluate past hazardous material sites on DOD property, to control the migration of hazardous contaminants, and to control hazards to health or welfare that may result from these past disposal operations. This program is called the Installation Restoration Program (IRP). The IRP is a four-phase program consisting of Phase I, Initial Assessment/Records Search, Phase II, Problem Confirmation; Phase III, Technology Base Development and Phase IV, Operations. Engineering-Science (ES) was retained by the Air Force Engineering and Services Center to conduct the Hancock Field Initial Assessment/Records Search under Contract No. F08637-80-G0009, Call No. 0014, using funding provided by the Air Force Tactical Air Command.

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INSTALLATION DESCRIPTION

Hancock Field is located in Onondaga County in central New York, approximately two miles north of Syracuse, New York. The 4789th Air Base Group, which is the host unit at Hancock Field, operates and maintains the installation and provides support to the 21st Air Division/ NORAD Region headquarters. This study includes properties owned by the Air Force and Air National Guard, but does not include properties owned by the City of Syracuse.

ENVIRONMENTAL SETTING SUMMARY

Several environmental setting conditions noted at Hancock Field need to be considered when evaluating past hazardous materials handling and disposal practices. These are as follows:

- The uppermost area aquifer, the glacial till, is exposed at ground surface. The aquifer is essentially unprotected from potential contamination by surface infiltration; water levels are reported to be shallow (six feet or less). A second soil aquifer, composed of lacustrine deposits, is also present at shallow

depths, but low permeability in this unit limits contaminant movement impacts.

- The rock aquifer is apparently in communication with the glacial till aquifer.
- The installation contains ground water discharge zones.
- Hancock Field and most adjacent communities purchase potable water from surface water sources.
- Domestic wells do not exist within three miles of the installation.
- The average annual net precipitation rate is 9.8 inches.
- Wetlands exist at Hancock Field as classified by the State of New York Department of Environmental Conservation.
- There are no known threatened or endangered plant or animal species on Hancock Field.

The above points indicate that potential pathways for the migration of contamination to area aquifers exist. As the installation contains ground-water discharge zones, contaminants entering the upper aquifer would probably be discharged to local streams or to the numerous wetland zones present. If migration of contamination exists, local surface waters should serve as an indicator.

METHODOLOGY

Interviews were conducted with base personnel (past and present) familiar with past waste disposal practices, file searches were performed for facilities which have generated, handled, transported, and disposed of waste materials, interviews were held with local, state and federal agencies, and site inspections were conducted at facilities that have generated, treated, stored, and disposed of hazardous waste. Seven sites located on the Hancock Field property were identified as containing potentially hazardous waste that could result in environmental contamination (Figure 1). These sites have been assessed using a rating system which takes into account factors such as site characteristics, waste characteristics, potential for contamination and waste management practices. The details of the rating procedure are presented in Appendix G and the results of the assessment are given in Table 1. Rating scores were developed for the individual sites and the sites are listed in order

FIGURE 1

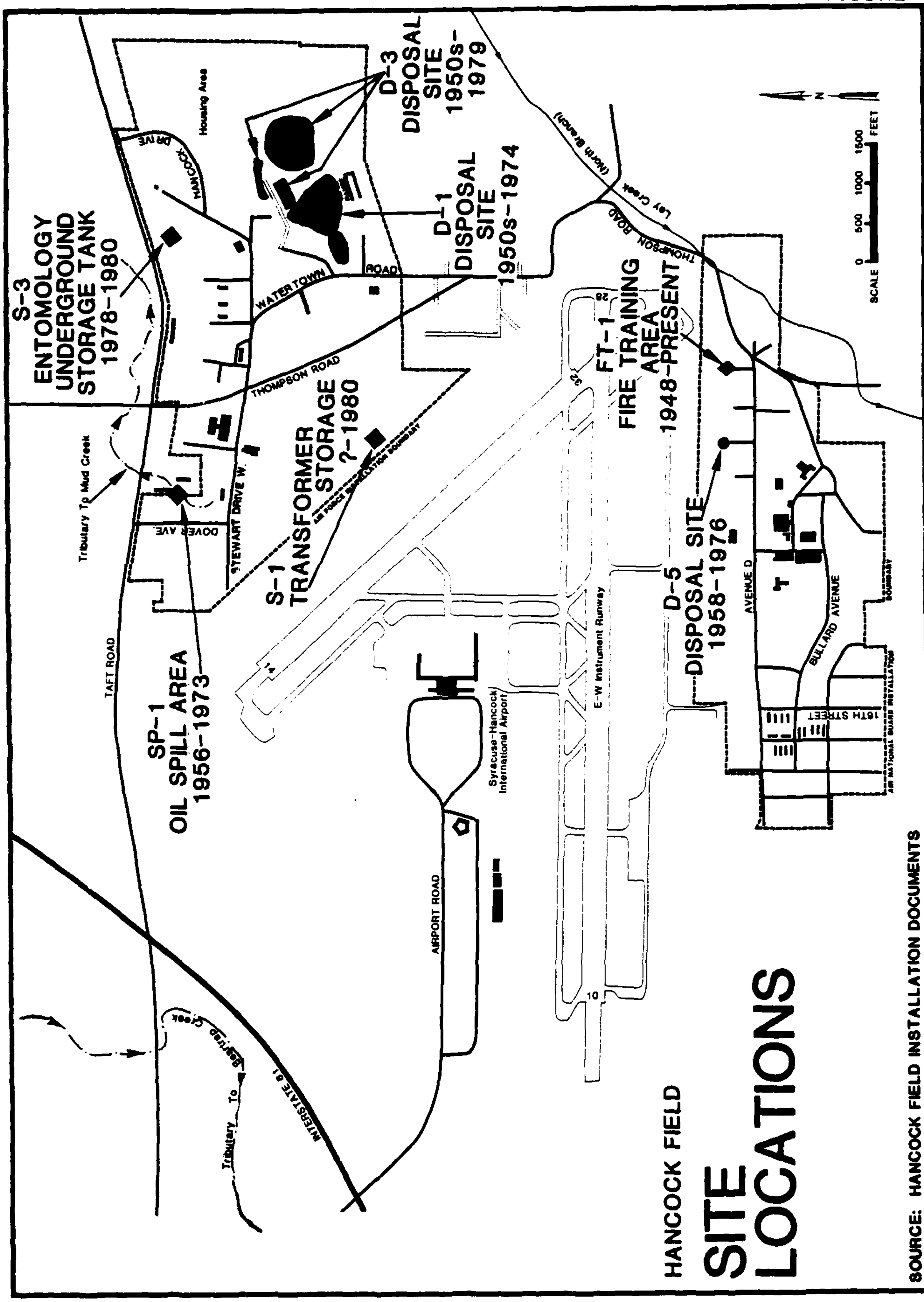

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TABLE 1

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

Rank	Site Name	Score
1	FT-1 Fire Training Area	67
2	D-3 Disposal Site	57
3	D-1 Disposal Site	56
4	D-5 Disposal Site	56
5	S-1 Transformer Storage Area	54
6	S-3 Entomology Underground Storage Tank	51
7	Sp-1 Old Spill Area	6

Note: This ranking was performed according to the Hazardous Assessment Rating Evaluation Methodology described in Appendix G. Individual site rating forms are located in Appendix H.

of ranking. The rating system is designed to indicate the relative need for more detailed site investigation due to potential environmental hazards.

FINDINGS AND CONCLUSIONS

Based on the results of the project team's field inspection, review of records and files, site inspections and interviews with base personnel, the following conclusions have been developed. The conclusions are listed by category.

1. Fire Training Areas

   Fire Training Site FT-1 has a high potential for environmental contamination.

2. Disposal Sites

   Disposal Sites D-3, D-1, and D-5 have a moderate potential for environmental contamination.

3. Hazardous Waste Storage Areas

   a. The old transformer storage area (Site S-1) has a low potential for environmental contamination.

   b. The entomology underground storage tank (Site S-3) has a low potential for environmental contamination.

4. Other sites are not considered to pose a significant hazard of environmental contamination.

Recommendations for further investigation in Phase II are listed in Table 2. These recommendations include ground-water monitoring and surface water and sediment monitoring.

TABLE 2

RECOMMENDED MONITORING PROGRAM FOR PHASE II
HANCOCK FIELD

Site	Rating Score	Recommended Monitoring	Comments
Fire Training Area Site FT-1	67	Install a monitoring well system consisting of one upgradient well and three downgradient wells to an approximate 30 feet depth. The wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for TOC, pH, TOH, and oil and grease. In addition, a minimum of four surface water and sediment samples should be collected in the runoff area north of the fire training area and analyzed for TOC, TOH, pH and oil and grease.	
Disposal Site Site D-3	57	Install a monitoring well system consisting of one upgradient well and three downgradient wells to an approximate 30 feet depth. These wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for the TOC, pH, TOH, and oil and grease. In addition, surface and sediment samples should be collected at 300 foot intervals along the landfill culvert to determine the presence of any suggested contaminants. The twelve samples should be analyzed for TOH, TOC and pH.	The upgradient well for Sites D-3 and D-1 should be the same well.
Disposal Site Site D-1	56	Install a monitoring well system consisting of one upgradient well and three downgradient wells to Otan approximate 30 feet depth. These wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for the TOC, pH, TOH, and oil and grease.	The upgradient well for Sites D-3 and D-1 should be the same well.
Disposal Site Site D-5	56	Install a monitoring well system consisting of one upgradient well and three downgradient wells to an approximate 30 feet depth. These wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for the TOC, pH, TOH, and oil and grease. In addition, a minimum of five surface water and five sediment samples should be collected and analyzed for TOC, TOH, and pH. The samples should be collected in the runoff area along the northern edge of the site and downstream of the site. The samples should be collected approximately 150 feet apart.	

SECTION 1

INTRODUCTION

SECTION 1
INTRODUCTION

BACKGROUND AND AUTHORITY

The United States Air Force has long been engaged in a wide variety of operations dealing with toxic and hazardous materials. Federal, state and local governments have developed strict regulations to require that disposers identify the locations and contents of disposal sites and take action to eliminate the hazards in an environmentally responsible manner. The Department of Defense (DOD) has issued Defense Environmental Quality Program Policy Memorandums (DEQPPM) 81-5 which require the identification and evaluation of past hazardous material disposal sites on DOD property, the control of migration of hazardous contaminants, and the control of hazards to health or welfare that could result from these past operations. This program is called the Installation Restoration Program (IRP). The IRP will be a basis for response actions on Air Force Installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. DEQPPM 81-5 implemented by Air Force message dated 21 January 1982 reissued and amplified all previous directives and memoranda on the IRP.

PURPOSE AND SCOPE OF THE ASSESSMENT

The Installation Restoration Program has been developed as a four-phase program as follows:

Phase I - Initial Assessment/Records Search
Phase II - Confirmation
Phase III - Technology Base Development
Phase IV - Operations (Control Measures)

Engineering-Science (ES) was retained by the Air Force Engineering and Services Center to conduct the Phase I Records Search at Hancock

Field under Contract No. F08637-80-G0009, Call No. 0014, using funding provided by the Air Force Tactical Air Command. This report contains a summary and an evaluation of the information collected during Phase I of the IRP. The study areas include properties owned by the Air Force and Air National Guard, but do not include properites owned by the City of Syracuse.

Phase I Project Description

cont The goal of the first phase of the program ~~was~~ to identify the potential for environmental contamination from past waste disposal practices at Hancock Field and to assess the probability of contaminant migration beyond the installation boundary. The activities undertaken by Engineering-Science (ES) in Phase I included the following:

(1) Reviewed site records;

(2) Interviewed personnel familiar with past generation and disposal;

(3) Inventoried wastes;

(4) Determined quantities and locations of past hazardous waste storage, treatment and disposal;

(5) Evaluated disposal practices and methods;

(6) Conducted field inspection;

(7) Gathered pertinent information from federal, state and local agencies;

(8) Assessed potential for contamination; and

(9) Determined potential for hazardous contaminants to migrate.

In order to perform the on-site portion of the Records Search phase, ES assembled the following core team of professionals whose qualifications are presented in Appendix A:

- W. G. Christopher, Environmental Engineer and Project Manager, ME, 6 years of professional experience
- J. R. Absalon, Hydrogeologist, BS Geology, 9 years of professional experience
- R. E. Reynolds, Chemical Engineer, MSCE, 8 years of professional experience

The on-site portion of the Records Search phase was performed at Hancock Field in March of 1982. During this period formal interviews were conducted with installation personnel. File searches were conducted

within several organizations which generate, handle, transport, and dispose of hazardous waste materials. On-site visits and field reconnaissance were conducted at all identified facilities that treated, stored or disposed of hazardous materials. These facilities include landfills, waste treatment facilities, material storage areas, laboratories, industrial shops and other support facilities. The information collected during this intensive records search is summarized and evaluated in subsequent sections of this report.

METHODOLOGY

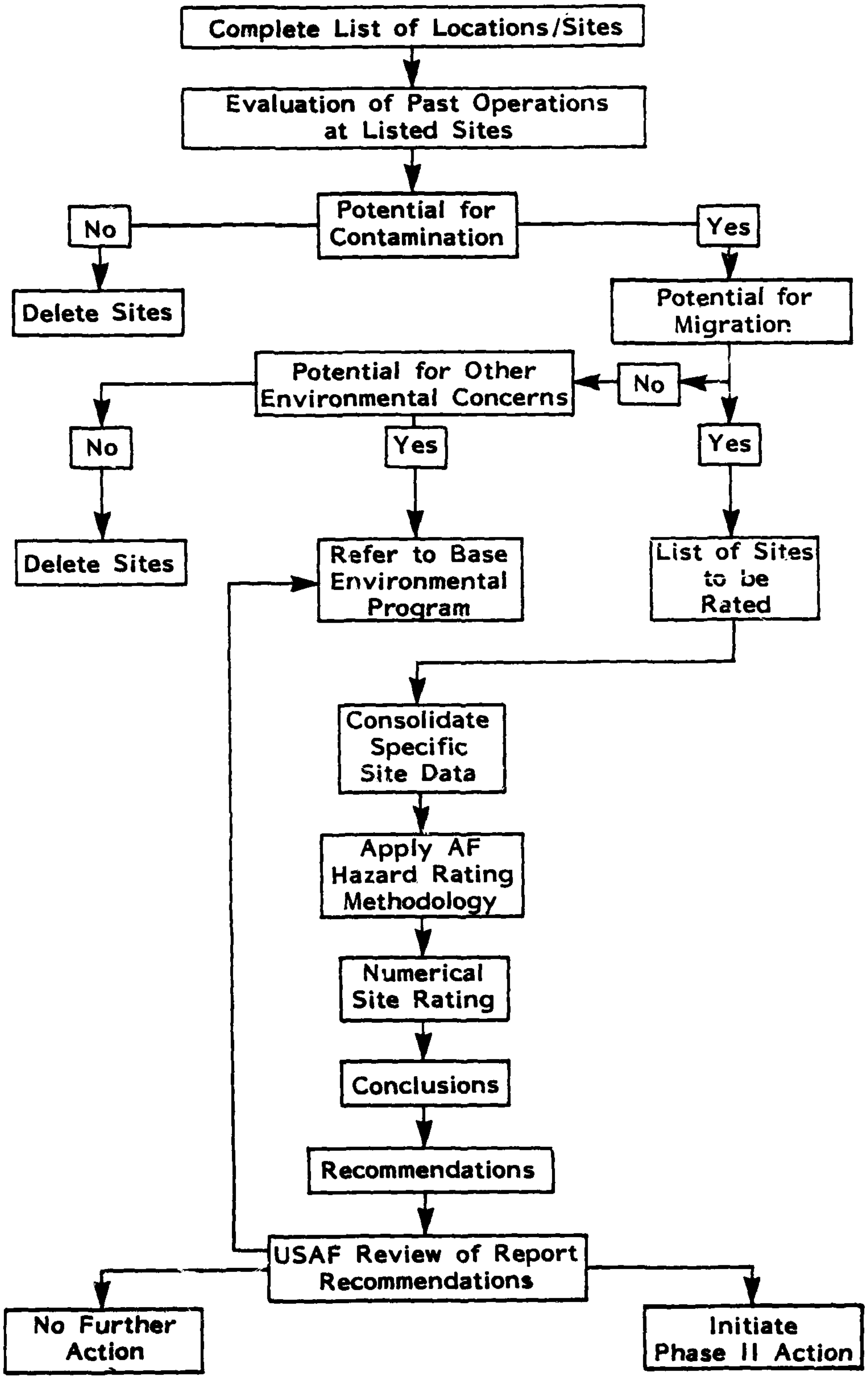
The methodology utilized in the Hancock Field Records Search is illustrated by the decision tree in Figure 1.1. This tree provides a logical algorithm for the consistent evaluation of all base practices. First, a review of past and present industrial operations was conducted at the installation. Information was obtained from available records such as shop files and real property files, as well as interviews with past and present installation employees from the various operating areas of the installation. The interviewees included current and past environmental personnel associated with the Civil Engineering Squadron, Bioenvironmental Engineering Services Division, and the Directorate of Maintenance. Several current or past personnel associated with the wastewater treatment plant, the pesticide operations, fuels management and the installation solid waste disposal areas were interviewed. Finally, experienced personnel from the tenant organizations were interviewed. Concurrent with the installation interviews the applicable federal, state and local agencies were contacted for pertinent Hancock Field related environmental data. These agencies included:

- U.S. Geological Survey Water Resources Division (Albany, New York)
- New York State Geologic Survey (Albany, New York)
- U.S.D.A. Conservation Service
- New York State Department of Environmental Conservation (Liverpool and Cortland)
- Onondaga County Environmental Management Council
- Onondaga County Public Health Department
- EPA Region II (New York, New York)

FIGURE 1.1

PHASE I INSTALLATION RESTORATION PROGRAM

DECISION TREE



The next step in the activity review was to determine the past management practices regarding the use, storage, treatment, and disposal of hazardous wastes from the various operations on the installation. Included in this part of the activities review was the identification of all known past landfill sites and burial sites, as well as any other possible sources of contamination such as fuel-saturated areas resulting from large fuel spills. A general ground tour of identified sites was then made by the ES Project Team to gather site specific information including (1) visual evidence of environmental stress, (2) the presence of nearby drainage ditches or surface-water bodies, and (3) visual inspection of these water bodies for any obvious signs of contamination or leachate migration.

A decision was then made, based on all of the above information, whether a potential exists for hazardous waste contamination in any of the identified sites. If not, the site was deleted from further consideration. For those sites where a potential for contamination was identified, a determination of the potential for contaminant migration was made by considering site-specific soil and ground-water conditions. If there was potential for on-site contamination or other environmental concerns the site was referred to the installation environmental program for further action. If no further environmental concerns exist, then the site was deleted. If the potential for contamination migration was considered significant, then the site was evaluated and prioritized using the site rating methodology (Appendix G).

The site rating indicates the relative potential for environmental contamination and migration at each site. For those sites showing a high potential, recommendations are made to verify and quantify the potential contaminant migration problem under Phase II of the Installation Restoration Program. For those sites showing a moderate potential, a limited Phase II program may be recommended to confirm that a contaminant migration problem does or does not exist. For those sites showing a low potential, no further follow-up Phase II work would be recommended.

SECTION 2

INSTALLATION DESCRIPTION

SECTION 2

INSTALLATION DESCRIPTION

LOCATION, SIZE, AND BOUNDARIES

Hancock Field is located in Onondaga County in Central New York, approximately two miles north of Syracuse, New York (Figures 2.1 and 2.2). A site plan is presented in Figure 2.3. The field was built and activated in 1942 as a staging area for war planes bound for England. At that time the base was known as the Syracuse Army Air Base.

Army Air Forces left Hancock Field in 1946 with the 138th Fighter Squadron of the New York Air National Guard (NYANG) remaining as the sole military occupant of the field until the Air Force returned in 1952 with the Headquarters of the 32nd Air Division.

In September 1963, the 26th Air Division Headquarters was moved to Stewart AFB, N.Y., and the Syracuse Sector, in a realignment of sector boundaries, became the Boston Air Defense Sector.

On April 1, 1966, a reconfiguration of the Air Defense Command renamed the Boston Air Defense Sector as the 35th Air Division, with headquarters remaining at Hancock Field.

In November 1969, in another Aerospace Defense Command realignment, the 35th Air Division was deactivated and replaced by the 21st NORAD Region/Air Division, with headquarters again at Hancock Field.

The newest realignment, occurring in mid 1979, places the 21st Air Division under Tactical Air Command. Earlier in the year, the 21st ADCOM Region was created. Hancock Field now serves as headquarters for the 21st NORAD Region, the 21st ADCOM Region and the 21st Air Division.

Hancock Field encompasses 765 acres. This includes 669 acres of fee owned land and 66 acres of fee condemned, easement and leased properties. Hancock Field employs approximately 1,134 personnel. Hancock Field has housing for 226 families.

Figure 2.3 illustrates the local properties owned by Syracuse, the Air Force and the Air National Guard. Properties owned by the City of Syracuse are not included in this study. However, properties owned by the Air Force and the Air National Guard are included in this study.

FIGURE 2.1

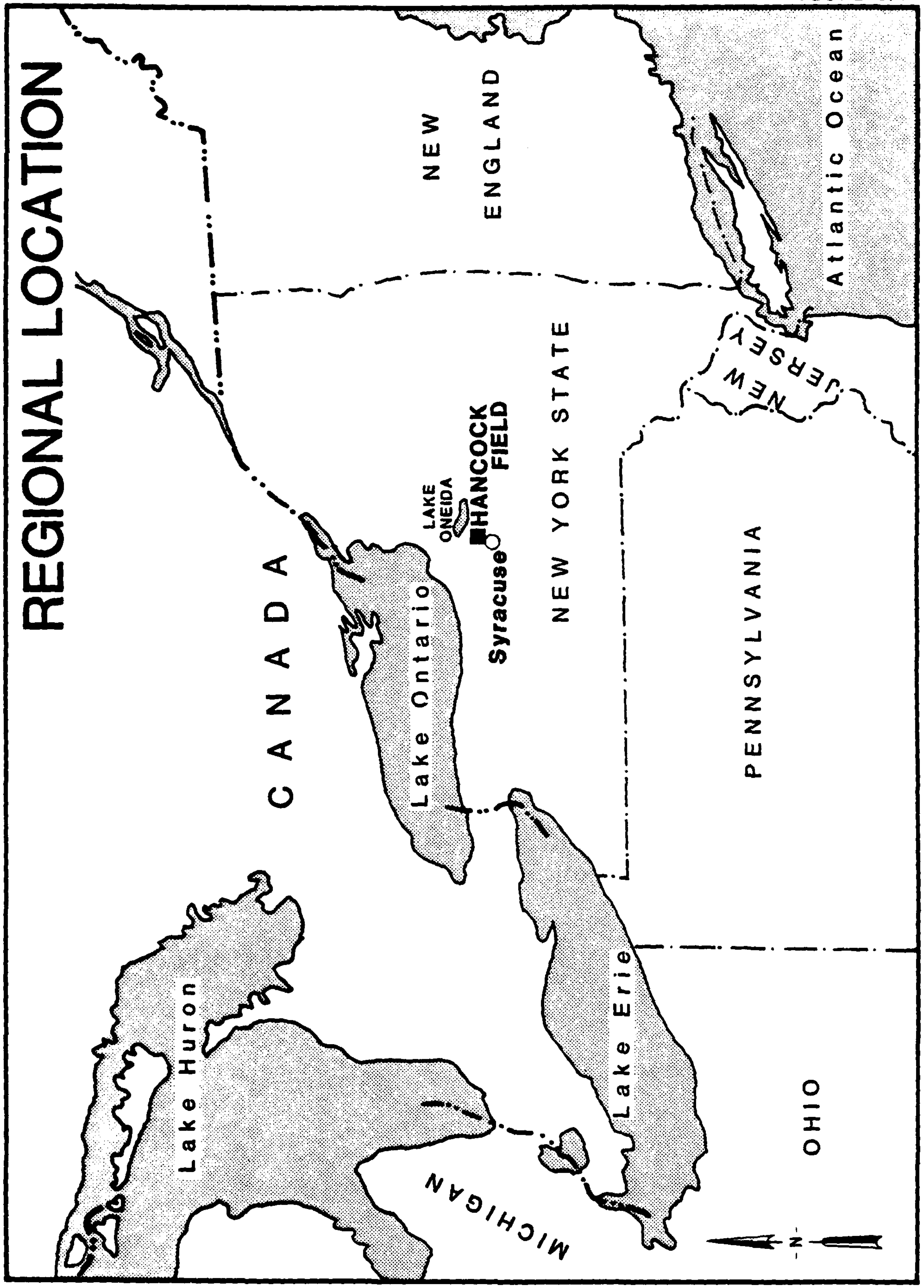

REGIONAL LOCATION
CANADA
NEW ENGLAND
NEW YORK STATE
LAKE ONEIDA
HANCOCK FIELD
Syracuse
Lake Ontario
Atlantic Ocean
NEW JERSEY
PENNSYLVANIA
Lake Erie
Lake Huron
MICHIGAN
OHIO
N

FIGURE 2.2

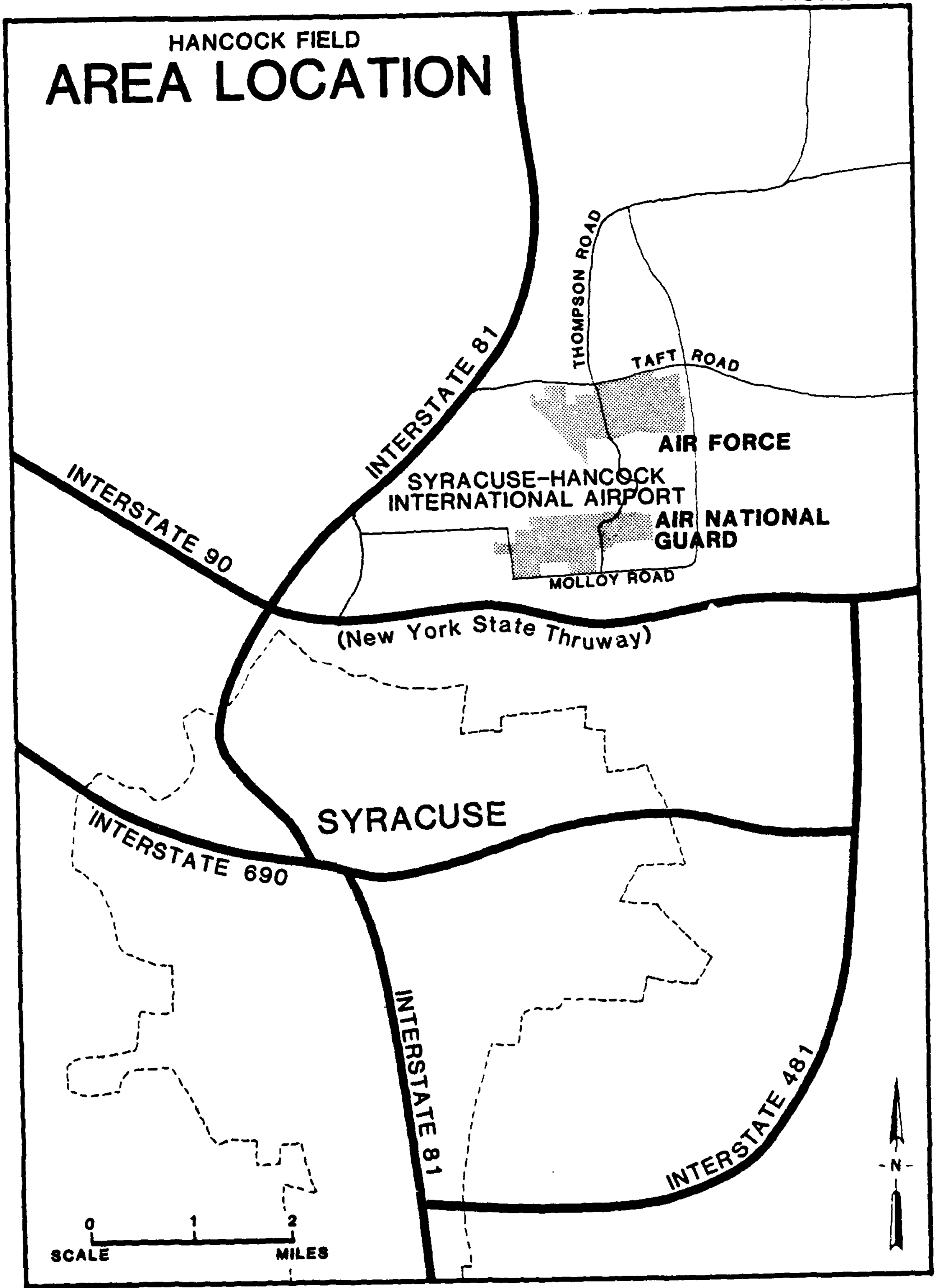


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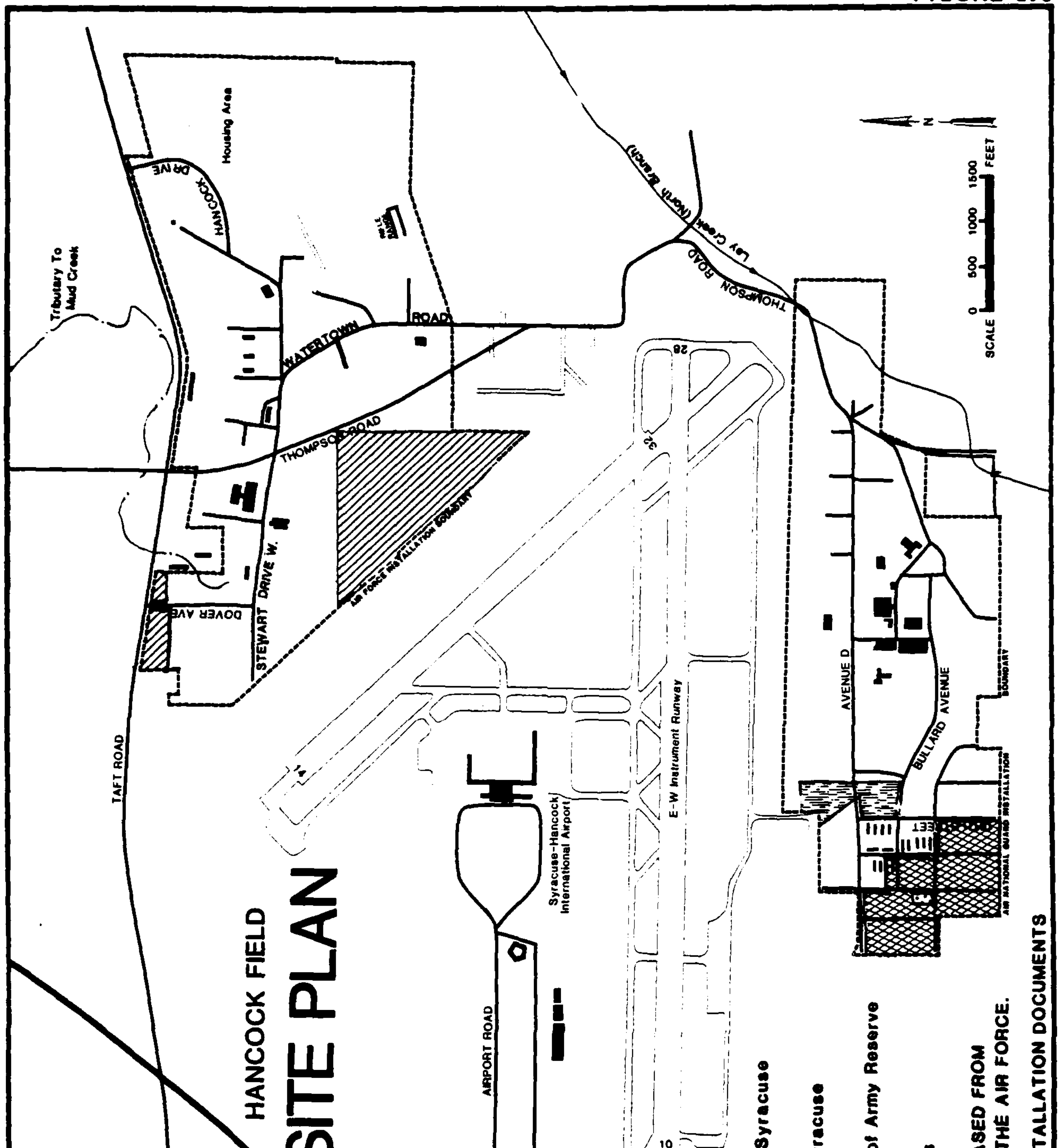
FIGURE 2.3


HANCOCK FIELD
SITE PLAN
LEGEND
Leased from City of Syracuse
Property of City of Syracuse
Outgranted to Dept. of Army Reserve
Land declared excess
NOTE: THOMPSON ROAD IS LEASED FROM
CITY OF SYRACUSE TO THE AIR FORCE.
SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS
SCALE
0 500 1000 1500 FEET
N
TAFT ROAD
INTERSTATE 81
AIRPORT ROAD
Syracuse-Hancock International Airport
E-W Instrument Runway
STEWART DRIVE W.
DOVER AVE
THOMPSON ROAD
WATERTOWN ROAD
HANCOCK DRIVE
Housing Area
Tributary To Mud Creek
Tributary To Beartrap Creek
Ley Creek (North Branch)
AVENUE D
BULLARD AVENUE
AIR FORCE INSTALLATION BOUNDARY
AIR NATIONAL GUARD INSTALLATION BOUNDARY
28
32
14
10

ORGANIZATION AND MISSION

The primary mission of Hancock Field is to provide support to the 21st NORAD Region/Air Division and other major Air Force Tenant organizations. The 4789th Air Base Group acts as the host unit at Hancock Field, and operates and maintains the installation and provides support to the 21st Air Division/NORAD Region headquarters. This support includes providing for the morale, welfare and recreational needs of Hancock personnel, and acquiring and maintaining all facilities and hardware.

Supply, accounting and finance, or contracting services are provided by the 416BMW, Griffiss AFB (SAC), New York, as arranged through Host-Tenant Agreements. The only flying mission is conducted by the 174th Tactical Fighter Wing (NYANG) and transient military aircraft.

A list of Hancock Field Host and Tenant units is provided below. A detailed discussion of major base tenant missions is presented in Appendix B.

HOST

4789th Air Base Group

TENANT AND OTHER INSTALLATION LOCATIONS

21st Air Division

21st Air Defense Squadron

3513th USAF Recruiting Group

Det 27, 12th Weather Squadron

Det 110, Air Force Office of Special Investigation

United States Army Communication Center - Northeast Telecommunications Switching Center

OLME AFCOMS/FCS Commissary

Civil Air Patrol

Det 2, 1913th Communications Group

Federal Aviation Administration (FAA)

Marine Corp Reserve Training Center

GUARD AND RESERVE UNITS

98th Division Aviation Support Facility 6 (U.S. Army Reserve)

174th Tactical Fighter Wing (NYANG)

138th Tactical Fighter Squadron

108th Tactical Control Flight

113th Tactical Control Flight

USAF Clinic Hancock

SECTION 3

ENVIRONMENTAL SETTING

SECTION 3
ENVIRONMENTAL SETTING

The environmental setting of Hancock Field is described in this section with the primary emphasis directed toward identifying natural features that may facilitate the movement of hazardous waste contaminants. Environmental conditions pertinent to this study are summarized at the conclusion of this section.

METEOROLOGY

Temperature, precipitation, snowfall and other relevant climatic data furnished by Detachment 27, 12th Weather Squadron, Hancock Field, New York, are presented as Table 3.1. The period of record is 1946 to 1978. The summarized data indicate that mean annual precipitation is 39.2 inches and that mean annual snowfall is 109 inches. According to Kantrowitz (1970), twenty-five percent of the total annual precipitation, about 9.8 inches, becomes net precipitation. Figure 3.1 graphically depicts the relationships of the hydrologic cycle components in the vicinity of Hancock Field.

GEOGRAPHY

The Syracuse area lies within the Ontario - Mohawk Lowland section of the Central Lowland Physiographic Province. The Ontario-Mohawk Lowland extends from Buffalo eastward to Albany and is characterized by generally level terrain, occasional low rolling hills and an absence of conspicuous local relief. Figure 3.2 depicts the physiographic regions of Central New York.

TOPOGRAPHY

The topography of the Hancock Field area is due primarily to the deposition and subsequent erosion of glacial and alluvial sediments resting on gently dipping bedrock. The usually flat topography is typical of the region, with no dominant hills present and surface elevations

TABLE 3.1
HANCOCK FIELD
SUMMARY OF CLIMATIC DATA

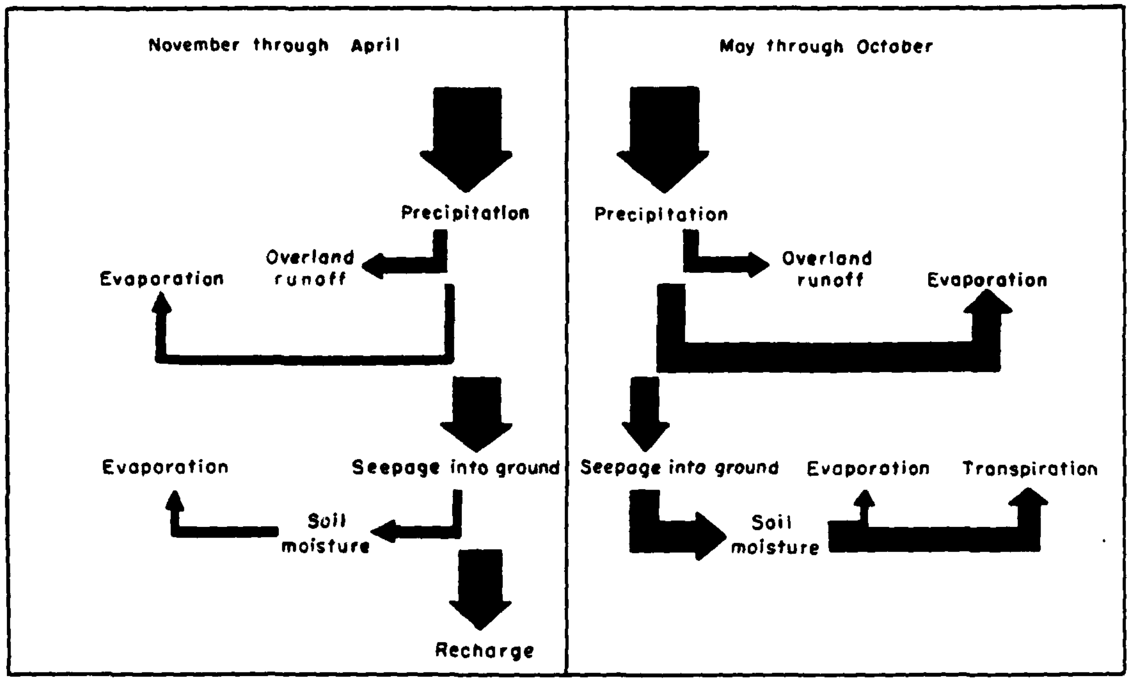
MONTH	TEMPERATURE (°F)					PRECIPITATION (IN)				SNOWFALL (IN)		
	Mean			Extreme		Monthly			Max 24 Hrs	Monthly		Max 24 Hrs
	Daily		Monthly									
	Max	Min		Max	Min	Mean	Max	Min		Mean	Max	
JAN	31	15	24	70	-26	2.7	5.8	1.0	1.4	27	72	22
FEB	33	16	25	66	-22	2.7	5.4	0.8	1.9	26	73	21
MAR	41	25	33	85	-16	3.1	6.8	1.1	1.4	18	39	14
APR	56	36	46	89	9	3.3	8.1	1.6	2.4	3	12	7
MAY	68	46	57	96	25	3.3	7.4	0.8	2.4	#	2	2
JUN	78	56	67	98	35	3.6	12.3	1.1	3.6	0	0	0
JUL	82	60	71	97	49	3.8	9.5	0.9	3.9	0	0	0
AUG	80	59	70	98	40	3.8	8.4	1.8	2.7	0	0	0
SEP	72	52	62	97	25	3.2	8.8	0.8	2.5	#	#	#
OCT	62	42	52	87	19	3.0	8.3	0.2	3.6	1	4	2
NOV	48	33	41	81	5	3.5	6.8	1.3	2.1	9	26	12
DEC	35	21	29	70	-20	3.2	5.0	1.7	1.8	25	53	15
ANNUAL	57	38	48	98	-26	39.2	12.3	0.2	3.9	109	73	22

#: AMTS < UNITS SHOWN IN HEADING

Source: Detachment 27, 12th Weather Squadron, Hancock Field, NY
Period of Record: 1946-1978

HANCOCK FIELD

Eastern Oswego River Basin Hydrologic Cycle

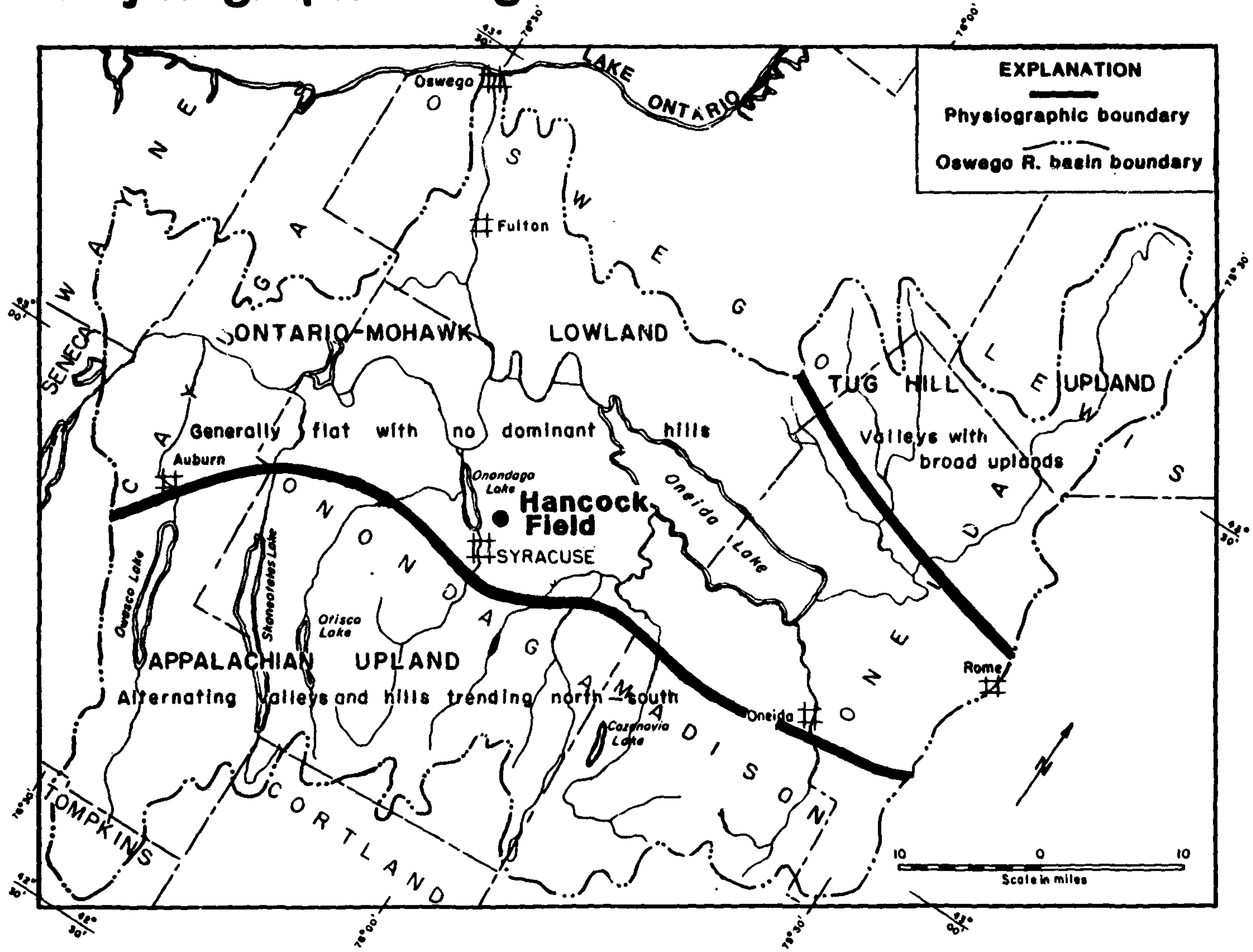


SOURCE: KANTROWITZ (1970)

FIGURE 3.2

HANCOCK FIELD

Physiographic Regions of Central New York



SOURCE: KANTROWITZ (1970)

ranging from 400 to 500 feet above mean sea level (MSL). Hancock Field surface elevations range from 397 feet MSL near the junction of Thompson and Watertown Roads to 434 feet MSL in the southwest corner of the New York Air National Guard area.

DRAINAGE

Hancock Field is drained by overland flow directed to local streams. The eastern and southern portions of the study area drain to the North Branch of Ley Creek or its unnamed tributaries. The northern portion of the study area drains to the unnamed tributaries of Mud Creek. The western section of the Syracuse-Hancock International Airport drains to Beartrap Creek and its unnamed tributaries. Figure 3.3 illustrates Hancock Field drainage features.

Numerous swamps and wetland zones have developed on and adjacent to Hancock Field. These zones have occurred because of:

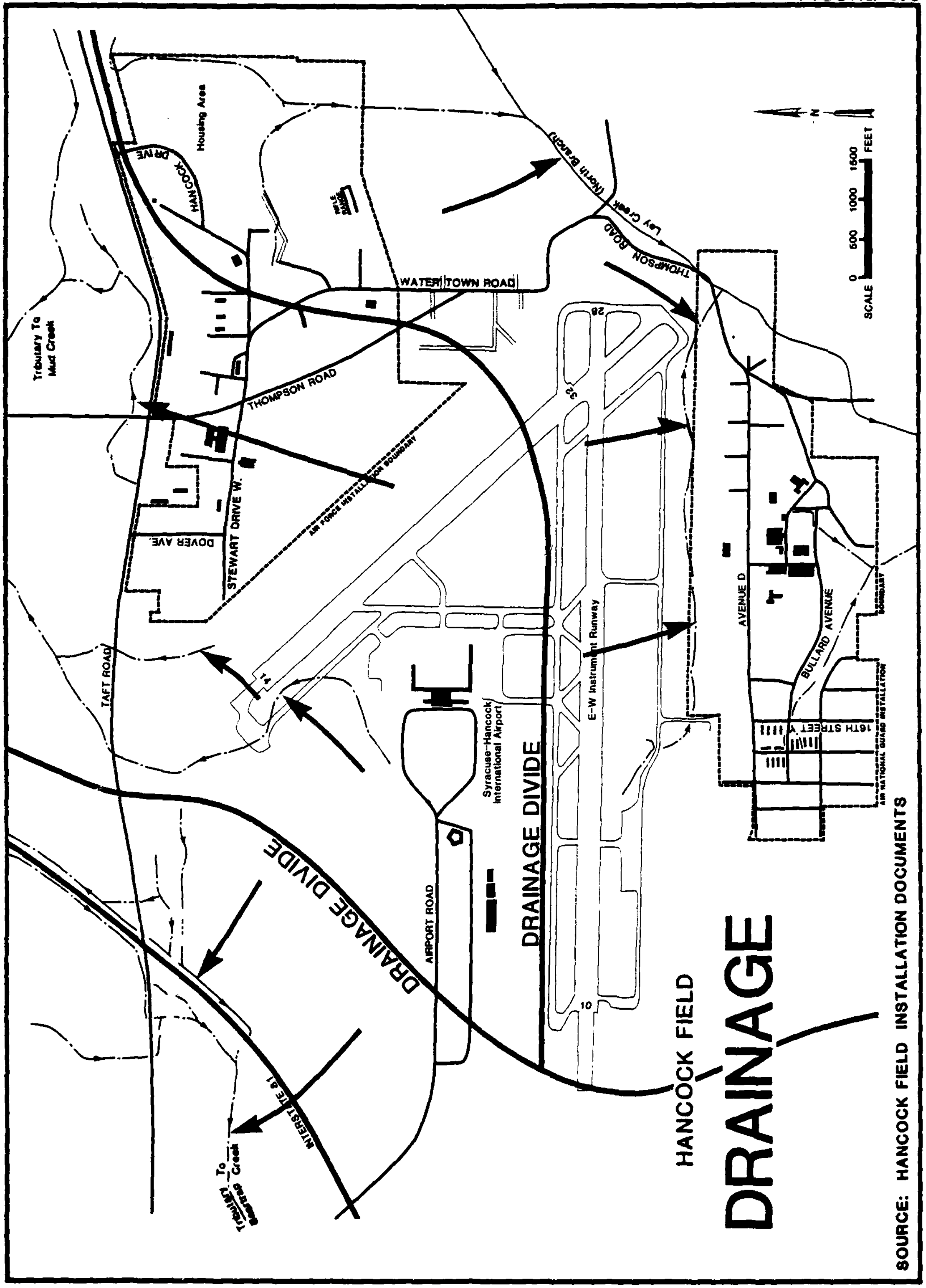
- The presence of local topographically low areas possessing restricted surface drainage which are usually underlain by fine-grained low permeability soils
- The discharge of ground water from the unconsolidated (upper) aquifer

Wetland areas in the vicinity of Hancock Field which have been identified by the New York State Department of Environmental Conservation (NYSDEC) are depicted in Figure 3.4.

SURFACE SOILS

Twenty-six soil units have been mapped in the Hancock Field area by the USDA, Soil Conservation Service (1977). Twenty-two of these units impose severe constraints over disposal facility development due to water table, flooding or permeability characteristics. The remaining four units, (urban land, made land, cut and fill land and gravel pit) may incorporate several individual soil types that have been altered, removed or buried by construction activities or site use modifications. Although no attempt has been made to estimate their properties, it is reasonably assumed that they also may impose similar constraints on disposal site construction due to the regional occurrence of high water tables (usually within six feet of ground surface) and wetland development. Hancock Field surface soils are described in Table 3.2 and are illustrated in Figure 3.5.

FIGURE 3.3



HANCOCK FIELD
DRAINAGE
SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS
DRAINAGE DIVIDE
DRAINAGE DIVIDE
Syracuse-Hancock International Airport
E-W Instrument Runway
AIRPORT ROAD
TAFT ROAD
THOMPSON ROAD
THOMPSON ROAD
WATERTOWN ROAD
STEWART DRIVE W.
DOVER AVE.
HANCOCK DRIVE
Housing Area
Tributary To Mud Creek
Ley Creek (North Branch)
AVENUE D
BULLARD AVENUE
16TH STREET
AIR FORCE INSTALLATION BOUNDARY
AIR NATIONAL GUARD INSTALLATION BOUNDARY
INTERSTATE 81
SCALE
0 500 1000 1500 FEET
N

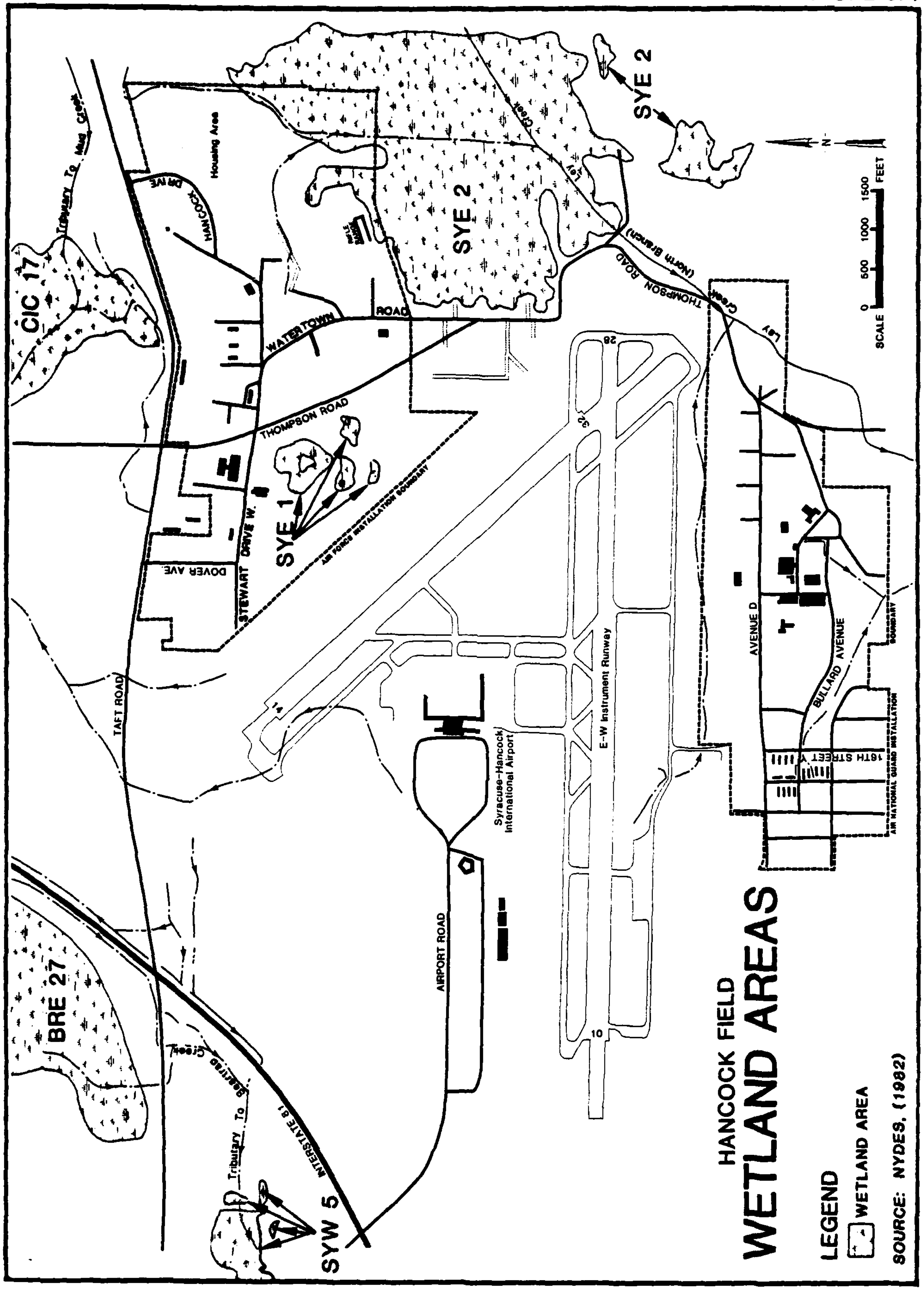


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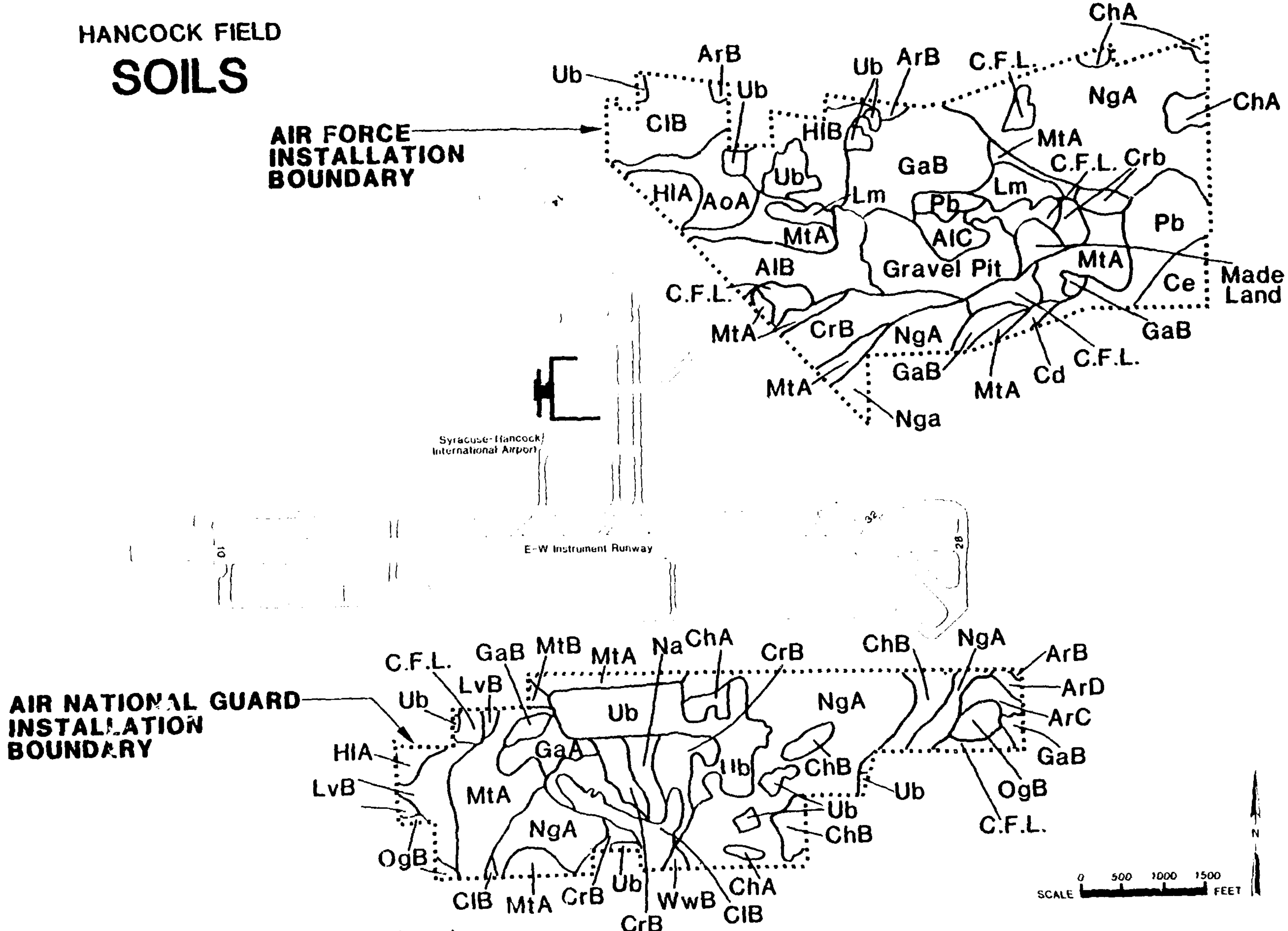
TABLE 3.2
HANCOCK FIELD SOIL UNITS

Symbol	Name	Slope Per Cent	USDA Texture (major fraction)	Thickness (inches)	Unified Classification (major fraction)	Permeability (inches/hour)	Landfill Disposal Site Use (constraints)
AlB	Alton	3-8	Gravelly fine sandy loam	144	GW, GP, GM, SM, SC	> 6.0	Severe - permeability
AlC	Alton	rolling	Gravelly fine sandy loam	144	GW, GP, GM, SM, SC	> 6.0	Severe - permeability
ArB	Arkport	2-6	Very fine sandy loam	70	SM	0.6-2.0	Severe - permeability
ArC	Arkport	rolling	Very fine sandy loam	70	SM	0.6-2.0	Severe - permeability
ArD	Arkport	hilly	Very fine sandy loam	70	SM	0.6-2.0	Severe - permeability
AoA	Appleton	0-3	Loam	60	ML, CL, SM, SC, GM, GC	0.06-2.0	Severe - high water table
Ce	Carlisle	Level	Muck	116	Pt	2.0-6.0	Severe - wetland
Cd	Canandaigua	Level	Mucky silt loam	54	OH, CH, ML	0.06-2.0	Severe - wetland
ChA	Collamer	0-2	Silt loam	50	ML, CL	0.06-2.0	Severe - high water table
ChB	Collamer	2-6	Silt loam	50	ML, CL	0.06-2.0	Severe - high water table
ClB	Colonie	0-6	Loamy fine sand	65	SM, SP	> 6.0	Severe - permeability
CrB	Croghan	0-6	Loamy fine sand	50	SM, SP	> 6.0	Severe - permeability
GaA	Galen	0-2	Very fine sandy loam	60	SM, ML	0.2-2.0	Severe - high water table
GaB	Galen	2-6	Very fine sandy loam	60	SM, ML	0.2-2.0	Severe - high water table
HlA	Hilton	0-3	Loam	60	ML, CL, SM, SC, GM, GC	0.6-2.0	Severe - high water table
HlB	Hilton	3-8	Loam	60	ML, CL, SM, SC, GM, GC	0.6-2.0	Severe - high water table
Lm	Lamson	Level	Very fine sandy loam	60	ML, OL, SM, SC	0.6-2.0	Severe - wetland
LvB	Lockport and Brockport	0-6	Silty clay loam	50	ML, OL, CL	< 0.2-0.6	Severe - wetland
MtA	Minoa	0-2	Fine sandy loam	60	ML, SM, OL, SC	0.6-2.0	Severe - wetland
MtB	Minoa	2-6	Fine sandy loam	60	ML, SM, OL, SC	0.6-2.0	Severe - wetland
Na	Navenburg	Level	Loamy fine sand	50	SM, SP	> 6.0	Severe - wetland
NgA	Niagara	0-4	Silt loam	50	ML, OL, CL	0.2-2.0	Severe - wetland
OgB	Ontario	2-8	Loam	60	ML, CL, SM, SC, GM, GC	0.6-2.0	Moderate - dense cohesive till
Pb	Palms	Level	Muck	50	Pt	2.0-6.0	Severe - wetland
WwB	Williamson	2-6	Silty loam	60	ML, CL	0.6-2.0	Severe - high water table
Ub	Urban land		These units may incorporate several soil series which have been altered, buried or removed by construction activities and related site use modifications. No estimate of individual characteristics is available, although it is assumed that severe constraints exist for disposal site development in these units because of similar conditions present for all soils in and adjacent to Hancock Field.				
ML	Made land						
CFL	Cut and Fill Land						
GP	Gravel Pit						

Source: USDA, Soil Conservation Service (1977)

HANCOCK FIELD
SOILS



SOURCE: USDA SOIL CONSERVATION SERVICE (1977)

GEOLOGY

The geology of the Syracuse area has been reported by Dale (1953), Fisher (1957) and Rickard and Fisher (1970), among others. A brief review of their work was performed in support of this investigation.

Consolidated Unit

The consolidated rock underlying Hancock Field is the Upper Silurian Age Vernon Formation. The Vernon Formation occurs as a linear feature, trending east-west from Rochester to Rome and varies in width from one-half mile at its type locality (Vernon) to eight miles at Port Byron. The Vernon, as described by Dale (1953) and Fisher (1957), consists primarily of a purplish red, red, gray, green or black shale (major fraction) and shaly dolomite (minor fraction). The unit is poorly stratified and reaches a maximum thickness of six hundred feet at its type locality. The shale is weakly lithified and possesses a crumbly nature, softening and spalling upon exposure of freshly-cut rock faces to the weather. As is the case with other major formations of central New York, the Vernon dips gently to the south at a rate of approximately fifty feet per mile. No faults have been mapped in the Vernon in the Hancock area. However, this unit may be extensively fractured and jointed locally.

At Hancock Field, the Vernon is typically overlain by a thin layer of glacial till. Test borings advanced at the Semi-Automatic Ground Environment (SAGE) area have determined that the shale bedrock is present at shallow depths, varying from 13.5 to 24.5 feet below existing ground surface (Hancock Field documents).

Unconsolidated Unit

The significant unconsolidated geologic unit of the study area consists of Pleistocene age glacial till and lacustrine deposits. The till represents the last (Wisconsin) intrusion into Central New York by the continental glacier. The unit is composed of both heterogeneous mixtures, with isolated, discrete homogeneous occurrences of clay, silt, sand, gravel, cobbles and boulders encountered locally. The till forms a relatively flat-lying veneer over the area bedrock, the Vernon Formation. At Hancock Field, glacial till thickness ranges from 13.5 feet in the vicinity of the SAGE area to more than 40 feet at a point on Thompson Road, just south of Temple Road. Numerous poorly drained areas have

resulted in swamps and peat bogs over the till locally. (Hancock Field wetlands identified by the NYSDEC were depicted on Figure 3.4.) The lithology of the glacial materials is graphically depicted in Figures 3.6 and 3.7, which are the logs of two representative installation construction (foundation) test borings.

According to Kantrowitz (1970) the lacustrine materials (accumulations of aqueoglacial sediments) are represented in the Hancock Field study area by clay and silt deposits. These deposits are distributed in an irregular manner and vary in thickness from a few feet to 20-40 feet. Frequently, thin layers of clay and silt will overlie the glacial till in the Hancock Field study area. Test borings for the Hancock Field base housing construction project encountered the lacustrine deposits. The material sampled was identified (by installation documents) as a soft silty clay or clayey silt with occasional sand lenses.

HYDROLOGY

Introduction

Ground water hydrology of the Syracuse area has been repc.ted by Halberg et al (1962), Kantrowitz (1970) and Weist (1978). Additional information was obtained from the U.S. Geological Survey District Water Resources Division office in Albany and from the Onondaga County Public Health Department.

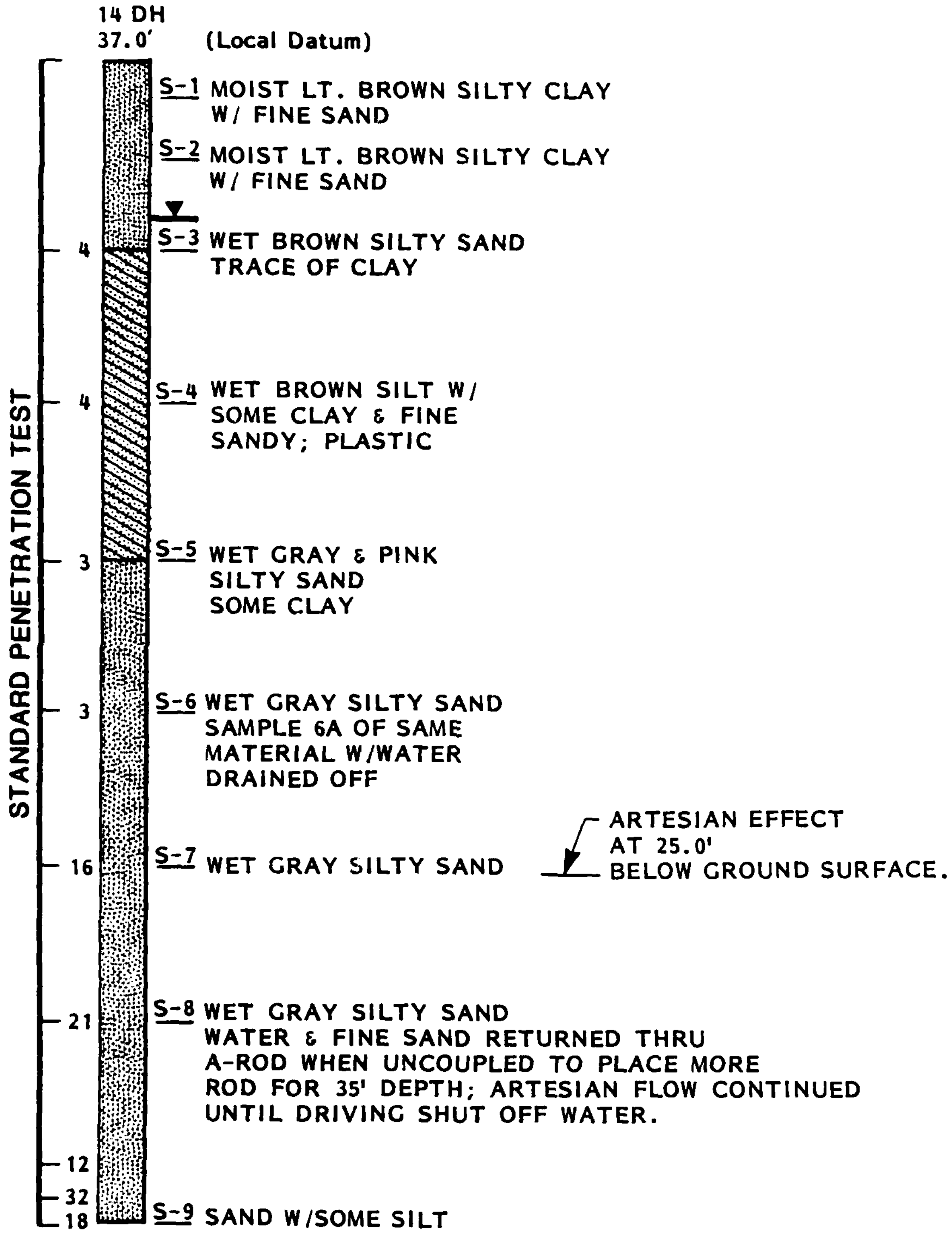
Hancock Field lies within the Great Lakes Region ground water basin (Weist, 1978). Ground water resources of this region are derived from two major sources: unconsolidated materials (homogeneous accumulations of coarse-grained glacial materials or recent alluvium) or the underlying rock aquifers. Recharge is obtained from precipitation. Portions of Hancock Field lie within local ground water discharge zones. This is supported by typically high soil unit water levels, perennial streamflow on and adjacent to the base and the presence of numerous large permanent wetlands on and adjacent to the installation.

Hydrogeologic Units

Two generalized hydrogeologic units have been identified at the base. These units generally correspond to the geologic groups previously described.

FIGURE 3.6

LOG OF TEST BORING 14 DH

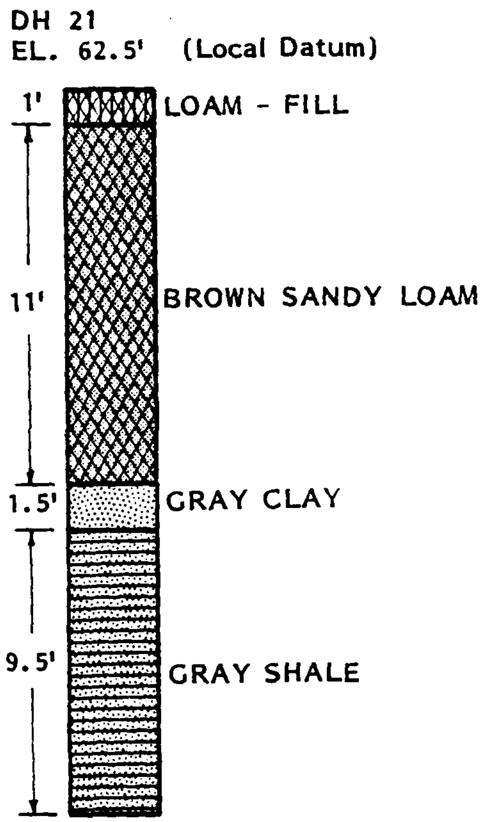


LOCATION: Thompson Road 500 feet South of Temple Road.

SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

NOT TO SCALE

LOG OF TEST BORING
DH 21



LOCATION: SAGE Complex
NOTE: Ground-water level not noted

SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

NOT TO SCALE

1. Unconsolidated Aquifer. This aquifer may be subdivided into two sections as described by Kantrowitz (1970): a glacial till unit and a lacustrine (clay and silt) unit. The distribution of the unconsolidated aquifers at Hancock Field are depicted in Figure 3.8. The glacial till consists of unsorted deposits of sand, gravel, clay and silt. As noted previously, its thickness ranges from 13.5 feet at the SAGE complex to more than 40 feet along Thompson Road. It normally overlies the rock aquifer and is assumed to be in hydraulic communication with the rock unit. Ground water occurs in the till under unconfined conditions. According to Kantrowitz (1970), wells drilled into this aquifer typically encounter ground water at shallow depths. Installation boring logs have noted ground water depths below ground surface as shallow as 0.5 feet to a maximum of 10 feet. Usually, excavated wells designed for domestic use (shallow wells of 36 inch or greater diameter) are successful in this unit, since the large storage area of such a well compensates for the poor water transmission characteristics of the unconsolidated materials.

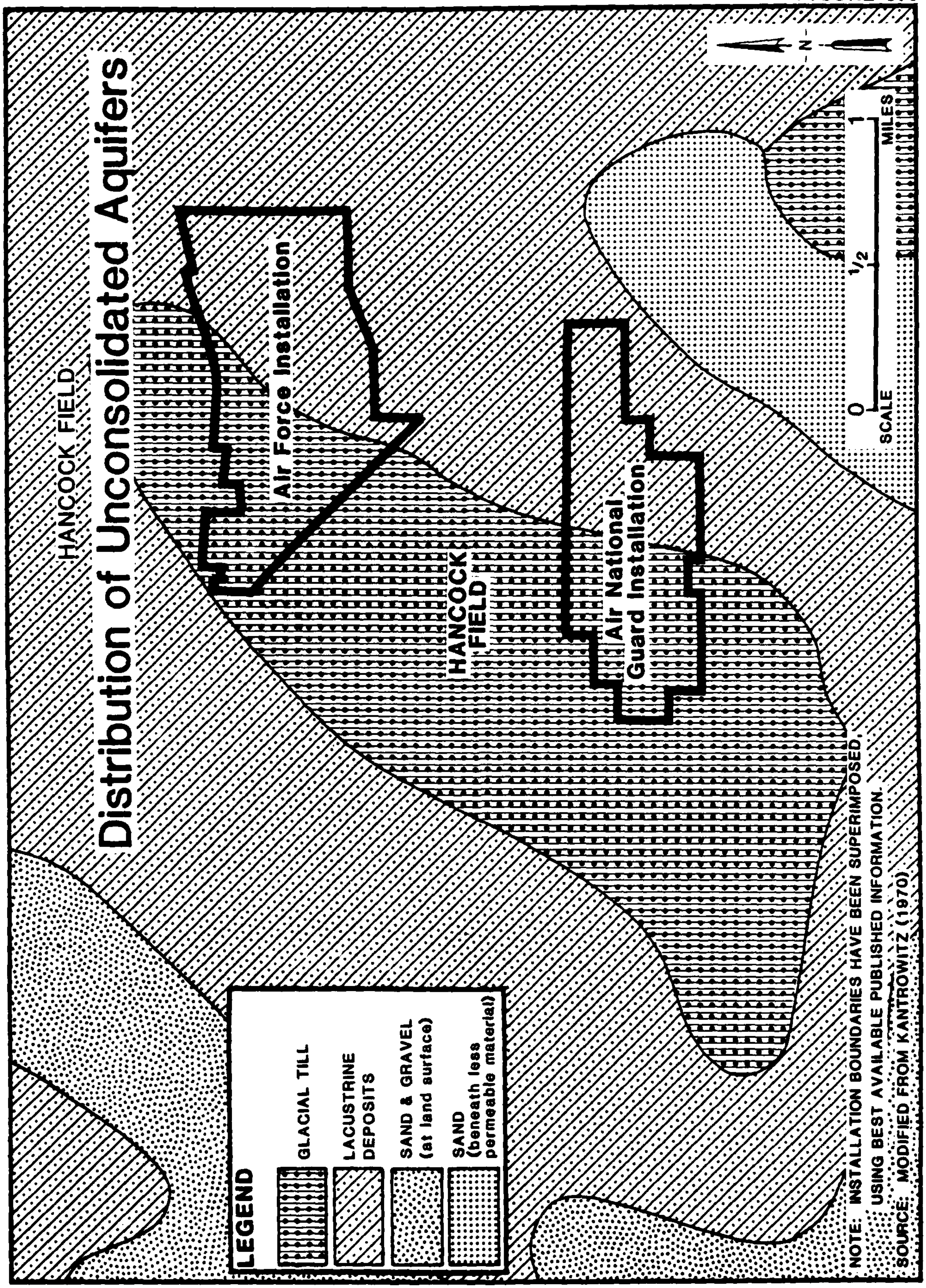
According to Kantrowitz (1970), the till typically yields 0.1 to 2.0 gallons per minute, which is not adequate for domestic consumptive use. In normal practice, this unit is not used in favor of the rock aquifer below which is a more reliable water source.

The lacustrine (clay and silt) deposits, although considered to be a water-bearing unit, tend to function more as a storage and confining unit for the underlying rock aquifer. Kantrowitz (1970) reports that yields from this clay and silt unit are very poor, ranging from 0.1 to 0.5 gallons per minute, which is inadequate for even conservative domestic use, where continuous pumpage is required. Where the lacustrine materials are present, most consumers penetrate the unit, preferring to obtain water resources from the more reliable rock aquifer below.

Sand and gravel deposits and sand deposits, both excellent regional water-bearing units, are not present at Hancock Field. These units are known for producing large quantities of good quality water where they do occur. Their location relative to Hancock Field is depicted on Figure 3.8.

The unconsolidated units receive recharge directly from precipitation falling on the unsaturated portion, or by percolation through a communicating unit in contact with the aquifer. According to Kantrowitz (1970), recharge occurs only during the period November through April,

FIGURE 3.8


HANCOCK FIELD
Distribution of Unconsolidated Aquifers
Air Force Installation
HANCOCK FIELD
Air National Guard Installation
LEGEND
GLACIAL TILL
LACUSTRINE DEPOSITS
SAND & GRAVEL (at land surface)
SAND (beneath less permeable material)
N
0
1/2
1
SCALE
MILES
NOTE: INSTALLATION BOUNDARIES HAVE BEEN SUPERIMPOSED, USING BEST AVAILABLE PUBLISHED INFORMATION.
SOURCE: MODIFIED FROM KANTROWITZ (1970)

when evapotranspiration is lowest. During the recharge or non-growing season, 50 percent of precipitation becomes recharge. Expressed in terms of annual climatic conditions, approximately 9.8 inches of the total yearly rainfall recharges the unconsolidated aquifer.

The phreatic surface of ground water contained in the unconsolidated aquifer probably follows the surface topography closely. Ground-water movement within the unconsolidated aquifer of the study area moves downslope under the influence of gravity, to discharge areas such as streams, ponds and swamps.

In the Oswego River basin area, seasonal ground-water elevations may fluctuate from five feet in valleys to twenty-five feet on hilltops, in accordance with seasonal climatic conditions (Kantrowitz, 1970).

2. Consolidated Aquifer. Immediately below the glacial till or lacustrine deposits is the consolidated rock aquifer, composed of shales and dolomitic shales of the previously described Vernon Formation. Water is contained in this unit in fractures, fissures, interstices and other secondary openings under water table (unconfined) or artesian (confined) conditions locally.

Rock aquifer wells drilled to depths of 100 to 200 feet typically exhibit water levels ranging from ten to thirty feet below ground surface. The consolidated rock and overlying soil aquifers apparently are in hydraulic communication, as water levels observed in wells sealed into either unit tend to be essentially similar. According to Kantrowitz (1970), the rock aquifer (sometimes identified as "the middle shale unit") yields an average of 20 gallons per minute for small diameter domestic wells and as much as 245 gallons per minute for large diameter industrial wells. The water, however, is very hard and contains excessive sulfate, thus limiting its use. The rock aquifer is recharged by water transmitted to it from overlying units. Flow directions within the rock aquifer are not known.

Local Water Sources

Hancock Field and adjacent industrial or domestic activities purchase water supplies from the City of Syracuse municipal system. Municipal supplies are typically obtained from surface sources, such as Lake Ontario, Otisco Lake and Skaneateles Lake. No active privately owned wells are known to exist within three miles of Hancock Field (Burdick, 1982).

SURFACE WATER QUALITY

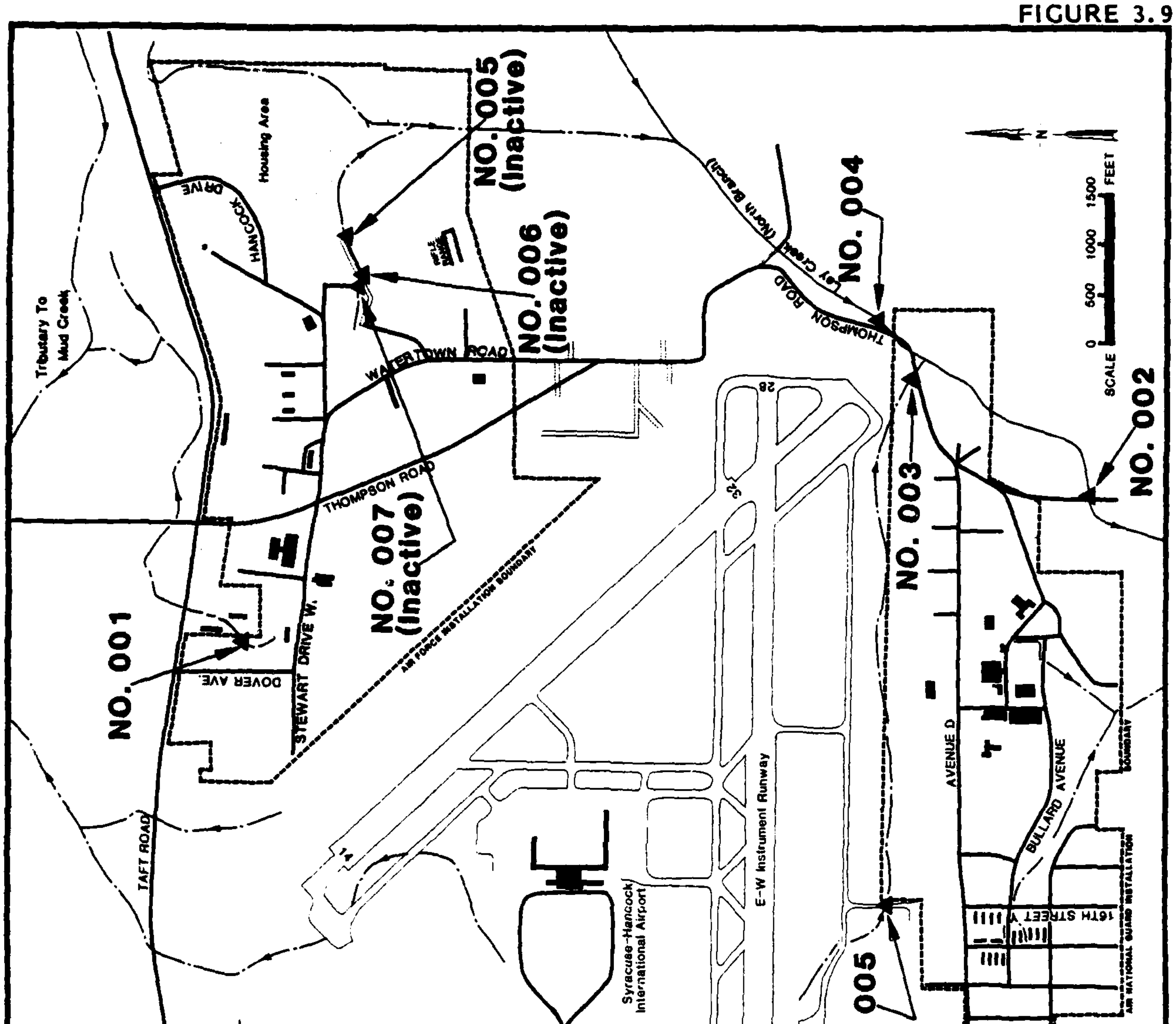
Water Quality Monitoring

Surface water samples have been collected under the auspices of the Bioenvironmental Engineering Services Division at several locations on the installation and analyzed for approximately 30 parameters. This surface water monitoring program has been voluntary rather than required to comply with any Federal or State permits. Monitoring of surface waters was discontinued in 1978 and then resumed beginning June, 1981.

The surface water sampling locations presently include five stations as described in Table 3.3 and shown in Figure 3.9. One sampling location (No. 001) is associated with Mud Creek and the remaining four locations are associated with Ley Creek. These sampling locations have been in use since the resumption of the surface water monitoring program in June, 1981.

Prior to 1978, additional locations were used for collection of surface water samples. The present sampling location No. 005 was not in use during this time. Former sampling location No. 005 and two additional locations, No. 006 and No. 007, were located near a drainage culvert servicing landfill Site D-3. Descriptions of these sampling locations and locations No. 001 through No. 004 are also summarized in Table 3.3. The approximate locations of the inactive locations No. 005, 006, and 007 are also shown in Figure 3.9.

The surface water sample data for the installation indicate that the surface water quality meets the criteria established by the EPA Interim Primary and proposed secondary drinking water standards except for concentrations of iron and manganese. According to (Hem, 1970) minor concentrations of these metals in the surface water are considered to be naturally occurring. A summary of the available surface water quality data is listed in Table C.1 of Appendix C.



HANCOCK FIELD
Surface Water Quality Sampling Locations

NOTE: THE INACTIVE LOCATIONS ARE APPROXIMATE.
SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

TABLE 3.3

SUMMARY OF HANCOCK FIELD ACTIVE AND INACTIVE SURFACE WATER SAMPLING STATION LOCATIONS

Site Location No.	Site Description
001	Mud Creek, directly behind Officer's Club
002	Ley Creek at Thompson Road Bridge
003	Stream behind aircraft maintenance hangar, West of Thompson Road
004	Ley Creek at the end of the runway
005	Intermittent stream parallel to taxiway H near Air National Guard ramp
005 (Inactive)	Downstream from landfill culvert
006 (Inactive)	Outfall landfill culvert
007 (Inactive)	Upstream from landfill culvert

Note: Inactive locations were used prior to 1978.

Wetlands

As previously discussed, several wetlands on and immediately adjacent to Hancock Field, have been identified and mapped by the New York State Department of Environmental Conservation (DEC). The DEC has classified these wetlands as follows:

Quadrangle	Wetland Identifier	Classification
Brewerton	BRE 27	II
Cicero	CIC 17	II
Syracuse East	SYE 1	III
	SYE 2	II
Syracuse West	SYW 5	II

Source: NYSDEC, Cortland District Office, 1982.

The above listed wetlands are depicted on Figure 3.4. See Appendix C (Table C.2) for a discussion of wetland classifications.

ENVIRONMENTAL SUMMARY

Geographic, geologic and hydrologic data evaluated for this study indicate the following.

- The uppermost area aquifer, the glacial till, is exposed at ground surface. The aquifer is essentially unprotected from potential contamination by surface infiltration; water levels are reported to be shallow (six feet or less) A second soil aquifer, composed of lacustrine deposits, is also present at shallow depths, but low permeabilities in this unit limit contaminant movement impacts.
- The rock aquifer is apparently in communication with the glacial till aquifer.
- The installation contains ground-water discharge zones.
- Hancock Field and most adjacent communities receive water supplies from municipal surface water sources.
- Domestic wells do not exist within three miles of the installation.

- Wetlands, as classified by the NYSDEC, exist at Hancock Field.
- The average annual net precipitation rate is 9.8 inches.

The above points indicate that potential pathways for the migration of contamination to area aquifers exist. Since the installation contains ground-water discharge zones, contaminants entering the upper aquifer would probably be discharged to local streams in base flow or to the numerous wetland zones present. If contaminant migration occurs, local surface water quality may serve as an indicator.

There are no known threatened or endangered species on Hancock Field as discussed in Appendix C.

SECTION 4

FINDINGS

SECTION 4
FINDINGS

To assess past hazardous waste management at Hancock Field current and past activities of waste generation and disposal were reviewed. This section contains a summary of the wastes generated by activity, a description of disposal methods used at Hancock Field and an identification and evaluation of disposal sites located on the installation.

PAST ACTIVITY REVIEW

To determine past activities on the installation that resulted in generation and disposal of hazardous waste, a review was conducted of current and past waste generation and disposal methods. This review consisted of interviews with installation employees, a search of files and records, and site inspections.

Potentially hazardous wastes generated on Hancock may be associated with any of the following four activities:

- Industrial Operations (Shops)
- Fuels Management (POL)
- Pesticide Utilization
- Fire Training

The following discussion addresses only those wastes generated on installation which are either hazardous wastes or potentially hazardous wastes. In this discussion a hazardous waste is defined as hazardous by the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). A potentially hazardous waste is one which was suspected of being hazardous although insufficient data was available to fully characterize the waste.

Industrial Operations (Shops)

Several industrial shops at Hancock Field generated hazardous wastes as a result of mission support activities. The Bioenvironmental Engineering (BEE) Office provided a listing of industrial shops which was used as a basis for evaluating past waste generation and hazardous material disposal practices. The files were used to compile a master list of industrial shops indicating shop location, handling of hazardous materials and generation of hazardous waste. This list is shown in Appendix D.

On-site interviews were conducted at many industrial shops, including those that generated the largest amounts of hazardous wastes. Several additional shops generating lesser amounts of hazardous wastes were contacted by telephone following the site visit. Information on these shops was obtained from personnel on base familiar with the particular shop's operation. In the interviews, past information on hazardous waste materials, waste quantities, and disposal methods were obtained from each shop. For each major hazardous waste, a hazardous waste disposal timeline was prepared from information provided by shop personnel and others familiar with the shop's operation.

A summary of information obtained in the detailed shop review is presented in Table 4.1. Information on past and present shop locations, hazardous wastes generated in the shop, waste quantities, and disposal methods are included. Disposal timelines are also shown for major wastes: the solid line represents confirmed waste disposal practices, and the dotted line indicates assumed disposal practices. Some shops that generated insignificant quantities of hazardous wastes have been eliminated from Table 4.1.

The Air Force shops located in the main base area have operated separately from the Air National Guard shops located south of the runways. The majority of wastes generated by shops in both organizations are comingled petroleum product wastes including oils, fuels, solvents and carbon remover. Several underground storage tanks are used by both organizations for collection of the comingled wastes. These wastes have been disposed of by off-base contractors who pump out the material. The practice has been utilized since the late 1950's. A summary of underground waste tank locations is shown in Table 4.2. These tanks are

TABLE 4.1

INDUSTRIAL OPERATIONS (Shops)

HAZARDOUS WASTE MANAGEMENT

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY (1)	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL 1950 1960 1970 1980
21 AIR DEFENSE SQUADRON				
SAGE UTILITIES	503	WASTE OIL, SOLVENTS	400 GALS./MO.	1957 OFF-BASE CONTRACTOR
		WASTE DIESEL FUEL	700 GALS./MO.	1957 OFF-BASE CONTRACTOR
		WATER TREATMENT CHEMICALS	55 GALS./MO.	1957 SANITARY SEWER
4789 ABG/ CIVIL ENGINEERING (CE)				
PAINT SHOP	266	PAINT WASTE RESIDUES	10 GALS./MO.	ON-BASE LANDFILL; CITY LANDFILL
		TRAFFIC PAINT SOLVENT RINSES	50 GALS./YR.	ON-BASE LANDFILL
		PAINT THINNERS	15 GALS./MO.	OFF-BASE CONTRACTOR
ENTOMOLOGY SHOP (2)	259	REPACKED BANNED PESTICIDES	100 GALS. STORED	1975 ON-BASE STORAGE
		EMPTY CONTAINERS	3 to 4 EA./YR.	RINSED CONTAINERS TO CITY LANDFILL; 1975; ON-BASE STORAGE
		RINSE SOLUTION	100 GALS./YR. 20 GALS./YR. (1980 to present)	SPREAD ON GROUND; 1975; U. G. TANK; SANITARY SEWER
PAVEMENTS AND GROUNDS	259	WASTE OIL	5 GALS./MO.	OFF-BASE CONTRACTOR
AUTO HOBBY SHOP	5	WASTE ENGINE OIL	35 GALS./MO.	1965 OFF-BASE CONTRACTOR
		SOLVENT SOLUTION	15 GALS./MO.	1965 SANITARY SEWER

KEY

——— CONFIRMED TIME-FRAME DATA BY SHOP PERSONNEL.

- - - - ESTIMATED TIME FRAME DATA BY SHOP PERSONNEL.

(1) BASED ON CURRENT RATES AND BEST ESTIMATES OF PAST RATES

(2) PRIOR TO 1975, BASE ENTOMOLOGY SERVICES WERE PROVIDED BY OFF BASE CONTRACTORS

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

HAZARDOUS WASTE MANAGEMENT

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL (1950 1960 1970 1980)
4789 ABG/LOGISTICS SECTION				
VEHICLE MAINTENANCE SHOP (located in Building 5 from 1952 to 1965)	442, 5	BATTERY ACID	1 GAL./MO.	NEUTRALIZED TO SANITARY SEWER
		WASTE ENGINE OIL AND HYDRAULIC FLUID	35 GALS./MO.	OFF-BASE CONTRACTOR
		DEGREASING SOLVENTS	5 GALS./MO.	OFF-BASE CONTRACTOR
		O/W SEPARATOR SLUDGE	1 GAL./3 MOS.	OFF-BASE CONTRACTOR
174 AIR NATIONAL GUARD (ANG)				
CORROSION CONTROL	1600	PAINT STRIPPER	900 GALS./YR.	(PAINT STRIPPER NOT USED) '57 OFF-BASE CONTRACTOR
		O/W SEPARATOR SLUDGE	30 GALS./4 MOS.	OFF-BASE CONTRACTOR
		THINNERS, SOLVENTS	20 GALS./MO.	(3) '57 OFF-BASE CONTRACTOR
NON-DESTRUCTIVE INSPECTION	610	WASTE OIL SAMPLES	1 GAL./MO.	'60 OFF-BASE CONTRACTOR
ENGINE SHOP	607	CARBON REMOVER	30 GALS./MO.	(3) OFF-BASE CONTRACTOR
		PD-680	25 GALS./MO.	(3) OFF-BASE CONTRACTOR
		WASTE ENGINE OIL	50 GALS./WK.	FIRE TRAINING OFF-BASE CONTRACTOR
		WASTE JET FUEL	5 GALS./MO.	FIRE TRAINING OFF-BASE CONTRACTOR
AEROSPACE GROUND EQUIPMENT (AGE) SHOP	601	PD 680	15 GALS./MO.	(3) OFF-BASE CONTRACTOR
		WASTE OILS	10 GALS./MO.	FIRE TRAINING OFF-BASE CONTRACTOR

KEY

——— CONFIRMED TIME-FRAME DATA BY SHOP PERSONNEL

------ ESTIMATED TIME FRAME DATA BY SHOP PERSONNEL

(3) DURING THE PERIOD 1948 TO 1957, THESE WASTES MAY HAVE BEEN DISPOSED OF AT SITE D-5 LOCATED NEAR THE "OLD STATE SHACK".

TABLE 4.1 (cont'd)

INDUSTRIAL OPERATIONS (Shops)

HAZARDOUS WASTE MANAGEMENT

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL (1950 1960 1970 1980)
174 AIR NATIONAL GUARD (ANG) (Continued)				
AEROSPACE GROUND EQUIPMENT (AGE) SHOP (Continued)	601	WASTE FUELS	150 GALS./YR.	FIRE PROTECTION TRAINING
		BATTERY ACID	2 GALS./MO.	NEUTRALIZED TO SANITARY SEWER
MUNITIONS SHOP	641	PD-680	20 GALS./MO.	(3) OFF-BASE CONTRACTOR
TIRE SHOP	610	PD-680	55 GALS./MO.	(3) OFF-BASE CONTRACTOR
PNEUDRAULICS SHOP	610	PD-680	55 GALS./MO.	(3) OFF-BASE CONTRACTOR
FUEL SYSTEMS SHOP	610	JP-4	175 GALS./MO.	FIRE PROTECTION TRAINING
VEHICLE MAINTENANCE SHOP	620	WASTE OILS	275 GALS./YR.	FIRE PROTECTION TRAINING, OFF-BASE CONTRACTOR
		HYDRAULIC FLUID	110 GALS./YR.	(3) OFF-BASE CONTRACTOR
		BATTERY ACID	100 GALS./YR.	NEUTRALIZED TO SANITARY SEWER
		PAINT THINNERS	55 GALS./YR.	(3) OFF-BASE CONTRACTOR
108 TACTICAL CONTROL FLIGHT (ANG)				
VEHICLE MAINTENANCE	619	BATTERY ACID	2 GALS./MO.	NEUTRALIZED TO STORM SEWER
		WASTE OILS	500 GALS./YR.	OFF-BASE CONTRACTOR
AGE SHOP	604	WASTE OILS WASTE FUELS	[illegible]0 to 60 GALS./YR.	(COMBINED WITH VEHICLE MAINTENANCE) '71 FIRE TRAINING

KEY

——— CONFIRMED TIME-FRAME DATA BY SHOP PERSONNEL

- - - - ESTIMATED TIME-FRAME DATA BY SHOP PERSONNEL

TABLE 4.2

SUMMARY OF SHOP WASTE TANKS

Shop Name	Tank Location (Building No.)	Tank Volume (Gallons)	Representative Waste Contents
Auto Hobby Shop	5	550	Waste auto oils
Vehicle Maintenance	442	2,000	Waste oil, hydraulic fluids
SAGE Utilities	503	1,000	Used Engine lube oil, solvents
		30,000	Separation tank for used diesel fuel
Maintenance Hanger	610[1]	500	Oils, hydraulic fluids, PD-680
Vehicle Maintenance	620	500	Engine oils, hydraulic fluids, paint thinners
Corrosion Control	1600	500	Paint stripper, waste, solvents

(1) The underground waste tank near Building 610 serves all drains in that building, the AGE shop in Building 601, and the Engine Shop in Building 607.

Source: Hancock Field Installation documents.

pumped out on an as-needed basis by an off-base contractor. Four of these tanks were sampled and analyzed for lead, chromium and cadmium as shown in Table 4.3. The results indicated that the Auto Hobby Shop waste oil contained 27 micrograms per kilogram lead. All other results showed insignificant amounts of these metals.

The paint shop in Building 266 routinely disposed of paint thinners used to clean their traffic paint spraying truck at the on-base landfill site. Traffic paint spraying occurs annually and a truck requires between 50 and 55 gallons of thinner per year to adequately remove all paint residues. This practice has been in effect since the mid-1960's.

Fuels Management

Fuels supply and disbursement responsibilities are managed by the 4789 Logistics Section for the Air Force and by the 174 Resources Squadron for the Air National Guard. The Air Force utilizes primarily fuel oil No. 2 and diesel fuel to supply building heating oil and generator fuel. The Air National Guard utilizes JP-4, MOGAS and diesel fuel. A summary of on-base fuel storage tanks indicating the type of storage, number of tanks and total tank capacities is shown in Table 4.4. Approximately 60 percent of the total storage capacity on-base is underground storage. The capacity of each of the above ground tanks is less than 2,000 gallons except the large JP-4 storage tank operated by the Air National Guard. The JP-4 tank is surrounded by a spill containment dike.

Fuel storage tank cleaning is accomplished on an as-needed basis. Prior to 1980, major storage tanks were routinely cleaned once per three years. Since 1980, these tanks have been inspected annually for sludge accumulation and cleaning has not been required. The major tanks which are located at SAGE facility on the main installation were cleaned in the early 1970's. The Air National Guard fuel storage tanks were last cleaned in 1979. Tank cleaning has always been performed by contractors and the waste sludges have always been disposed of off-base.

Daily liquid level gauging occurs for the installation service station gasoline tank, all of the Air National Guard storage tanks and the SAGE facility diesel and fuel oil tanks. Monthly liquid level gauging occurs for other storage tanks. Pressure testing of storage tanks is not routinely performed. However, based on tank liquid inventories no known leaks have occurred in the past.

TABLE 4.3

SUMMARY OF WASTE OIL SAMPLE ANALYSES

Base Sample Number	Facility/Bldg. Location	Cd (μg/kg)	Pb (μg/kg)	Total Cr (μg/lg)
10-80-11	Vehicle Maintenance Waste Oil Sump (442)	<0.1	<2.4	<0.1
10-80-12	SAGE Utilities (503)	<0.1	0.1	<0.1
10-80-13	SAGE Utilities Shop Tank (503)	<0.1	<0.1	<0.1
10-80-14	Auto Hobby Waste Oil (5)	<0.1	27.0	<0.1

Note: Date of Analysis: December 2, 1980.
<: Less than detectable limits.

Source: Hancock Field Installation documents.

TABLE 4.4

SUMMARY OF INSTALLATION FUELS STORAGE

HANCOCK FIELD

Product	Type Storage	Number of Tanks	Total Capacities (Gallons)
	U.S. Air Force - Main Base		
Fuel Oil No. 2	Above Ground	9	3,525
Fuel Oil No. 2	Below Ground	15	79,800
Diesel Fuel No. 2	Above Ground	1	1,000
Diesel Fuel No. 2	Below Ground	3	90,000
MOGAS	Below Ground	5	20,000
	N.Y. Air National Guard		
JP-4	Above Ground	1	215,000
JP-4	Below Ground	6	150,000
MOGAS	Below Ground	1	5,000
Diesel Fuel No. 2	Below Ground	1	5,000

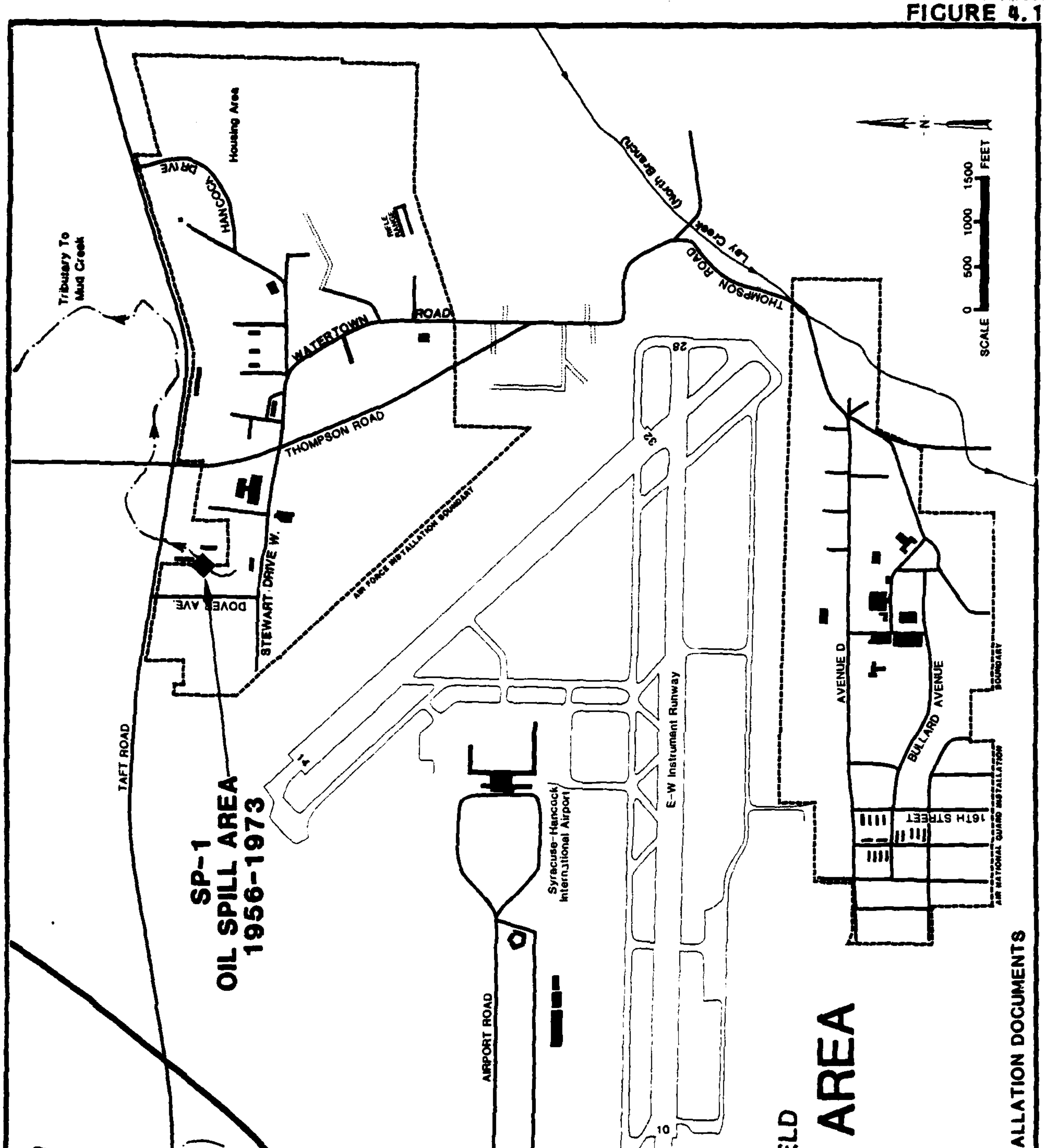
Hancock Field has had few significant spills of fuels or other petroleum products in the past. The record of spills obtained during the on-site interviews included two minor incidents of accidental vent overflows one of JP-4 and one of fuel oil from underground tanks. In both cases, the estimated spill quantity was less than 50 gallons. The spill areas were cleaned up, removed and replaced with uncontaminated fill material. Prior to 1972, minor fuel spills from the SAGE plant were discharged to the storm sewer which subsequently discharged at Site SP-1 as illustrated in Figure 4.1. In 1972 an existing 30,000 gallon tank at SAGE was converted to an oil separation tank to prevent fuel spill discharges. Following installation of the oil separation tank contaminated soil from the storm sewer ditch was removed and replaced with uncontaminated fill material. This site presents a minor potential for contamination due to spillage which occurred prior to 1972.

Pesticide Utilization

Prior to 1975, the pest control services were provided by off-base contractors. The contractor was responsible for proper off-base disposal of pesticide containers. An in-house pesticide program was implemented at the main installation on Hancock Field in 1975. The Air National Guard has always provided separate pest control services to their units through off-base contractors.

From 1975 to 1978, the Entomology Shop, located in Building 259, disposed of pesticide rinse solutions from containers and spray equipment by spreading the solution over the ground at the shop. From 1978 until 1980 this shop disposed of these rinse solutions in a 500 gallon underground concrete holding tank (Site S-3). According to installation personnel, the holding tank was suspected of ground water infiltration during wet weather. The tank was pumped out once.

In June, 1979 the liquid wastes contained in the tank were sampled and analyzed for 23 major pesticides. The sample results indicated none detected (less than qualitative detection limits) for all parameters. Nonetheless, usage of this tank was discontinued in June, 1979. The tank was pumped out by installation personnel into abandoned site WT-2. The pesticide containers (unrinsed) are stored in Building 759 pending final disposal through the Defense Property Disposal Office (DPDO) at Griffiss AFB.



HANCOCK FIELD

PAST SPILL AREA

SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

Fire Protection Training

The Fire Department (NYANG and Air Force) has operated a fire protection training area since 1948. This area is used for practice exercises where petroleum based fires are set and then extinguished. The fire training area was located at Site FT-1 as illustrated in Figure 4.2. The site has operated from 1948 to present. A second site was used for several years on property now owned by the City. This site will not be discussed further since the site is located outside the scope of this study.

Site FT-1 is a circular and uncontained area about 150-200 feet in diameter. For past fire training exercises (see Appendix F photographs) about 100-150 gallons of waste fuel (oils, JP-4, and/or waste solvents) from the SAGE area were spilled on water saturated ground within this area. This flammable material was ignited and then extinguished with water, Aqueous Film Forming Form (AFFF) or Chlorobromethane (CB). Protein-based foams may also have been used in the early days of fire training operations. Fire training exercises at this site have been conducted as frequently as once per week, although once per month was more typical.

After completion of fire training exercises, waste materials and residue remain on the area and infiltrate into the ground or contribute to runoff from the area which drains to a depression just north of the training area. Based on a visual inspection the site soils were contaminated with waste oil residue and burnt debris. There was also evidence of contaminated runoff in the depression area just north of the fire training area.

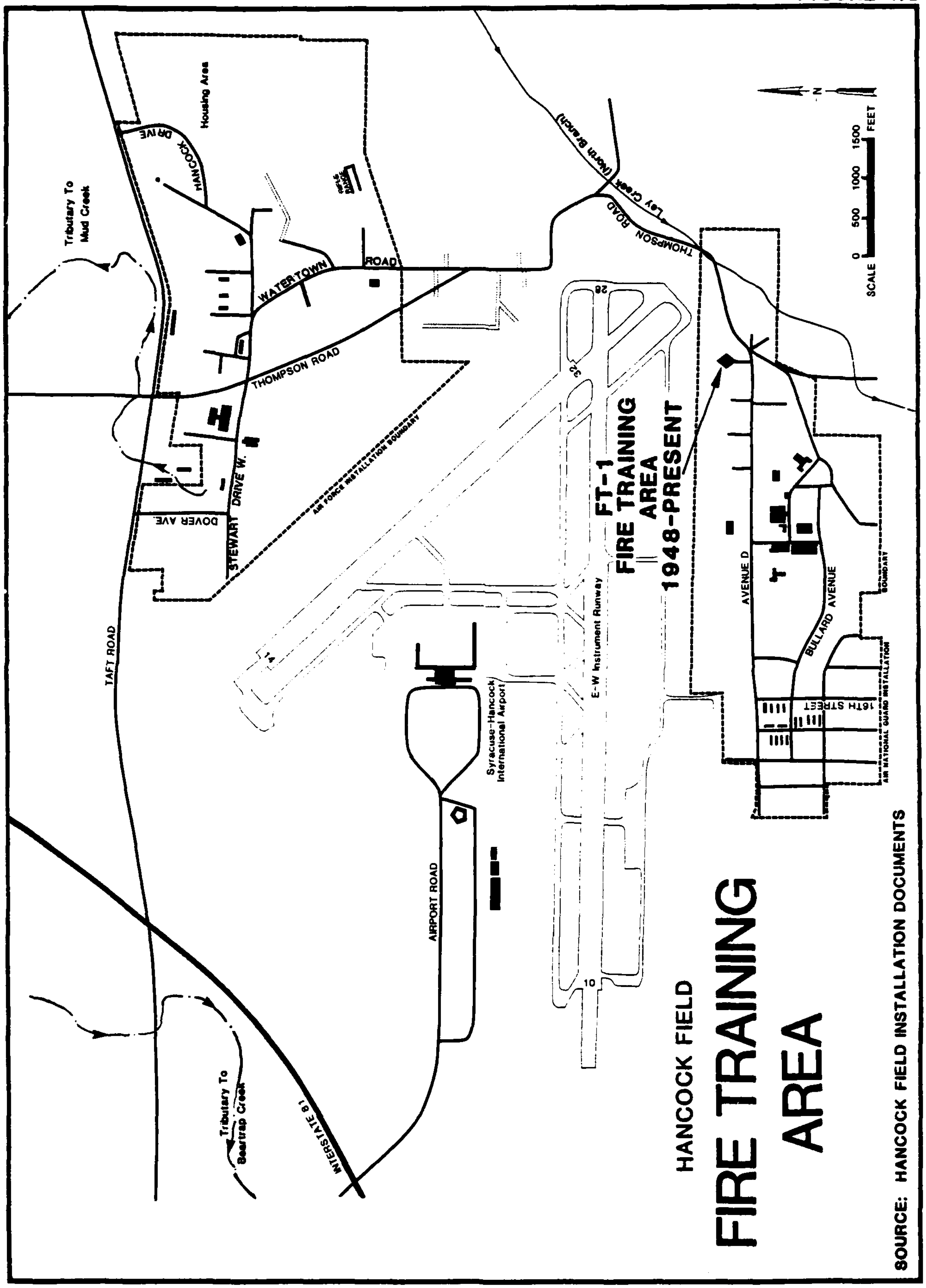
Adjacent to Site FF-1 are thirty-four 55 gallon drums of waste fuel in temporary storage.

WASTE STORAGE AND DISPOSAL OPERATIONS

The on-site facilities which have been used for management of solid and liquid wastes at Hancock Field can be categorized as follows:

- Hazardous waste storage
- Landfills and disposal sites
- Waste treatment systems and seepage fields
- Storm sewers
- Sanitary sewers
- Oil/water separators

FIGURE 4.2



HANCOCK FIELD
FIRE TRAINING AREA
SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS
FT-1
FIRE TRAINING AREA
1948-PRESENT
Housing Area
HANCOCK DRIVE
Tributary To Mud Creek
Tributary To Beartrap Creek
WATERTOWN ROAD
THOMPSON ROAD
TAFT ROAD
DOVER AVE
STEWART DRIVE W.
AIR FORCE INSTALLATION BOUNDARY
Ley Creek (North Branch)
E-W Instrument Runway
Syracuse-Hancock International Airport
AIRPORT ROAD
INTERSTATE 81
AVENUE D
BULLARD AVENUE
16TH STREET
AIR NATIONAL GUARD INSTALLATION BOUNDARY
SCALE 0 500 1000 1500 FEET
N

The types of waste management facilities handled are discussed individually herein.

Hazardous Waste Storage

Several hazardous material and waste storage sites have been located on Hancock Field. These sites are areas of interest and were reviewed during the on-site survey. These sites are also illustrated in Figure 4.3.

Site S-1 Transformer Storage Area

Prior to 1977 a 15' by 10' area at Building 530 was utilized as a transformer storage area. As many as nine transformers have been stored in this area at one time and only two were PCB contaminated. In the past, minor transformer leakage has occurred at the site. No soils analyses have been performed in this area. This site presents a minor potential for contaminant migration.

In 1980 the PCB contaminated transformers were transferred from Building 530 to Building 759 (Site S-2 Hazardous Waste Material Storage Site).

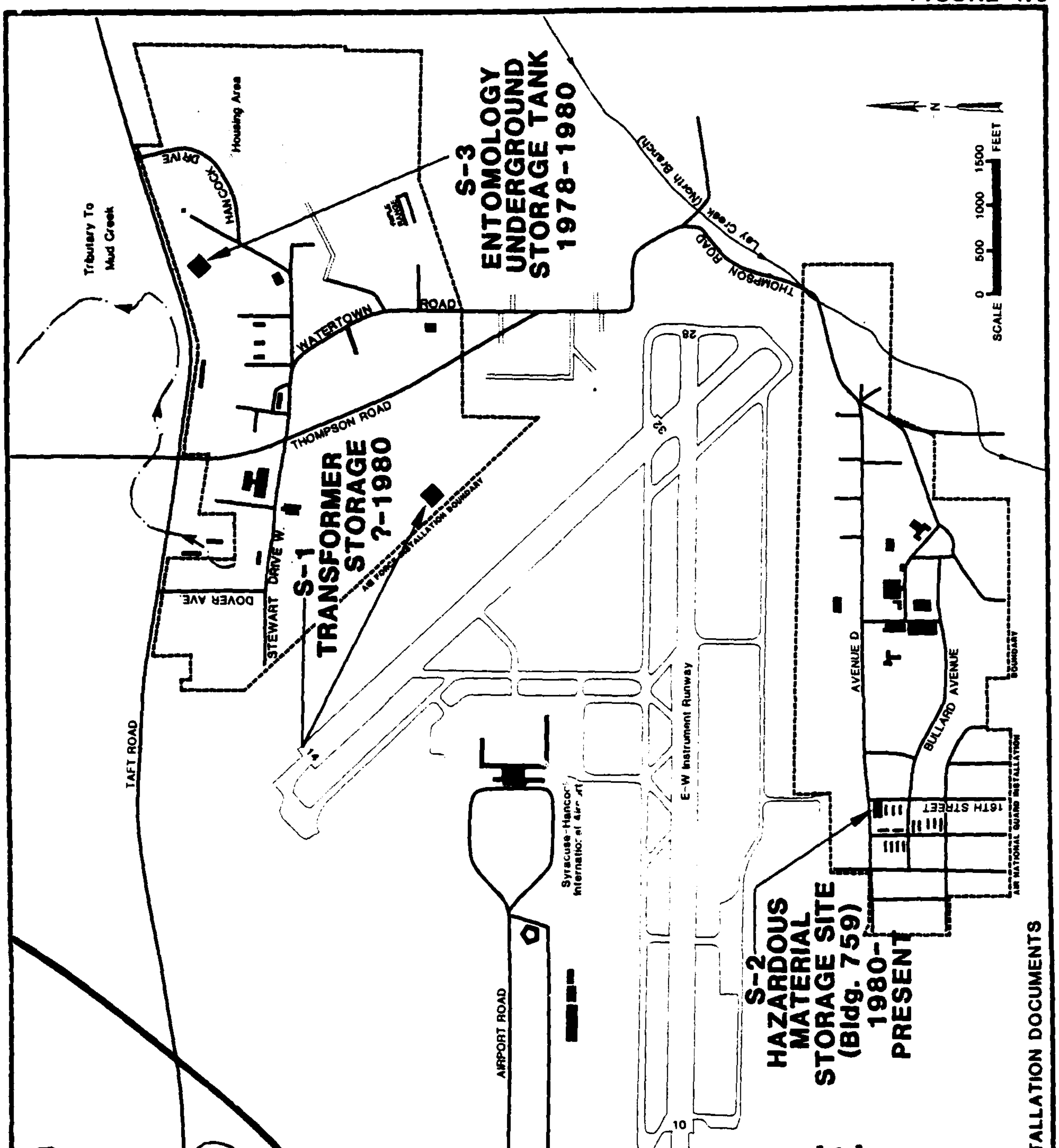
Site S-2 Hazardous Material Storage Site (Building 759)

Building 759 is utilized as a transformer storage site as well as a storage area for empty pesticide containers. The building has been utilized since 1980. The building has concrete floors with an 8" concrete dike surrounding the storage area. No known spills have been observed at this location. This site does not present a potential for migration of contaminants.

Site S-3 Entomology Underground Storage Tank

A 500 gallon underground concrete holding tank (Site S-3) was used for storage of pesticide rinse solutions from containers and spraying equipment during 1975 to 1980. According to installation personnel this holding tank was subject to ground-water infiltration during wet weather and during dry weather the potential for exfiltration existed. Usage of this tank was discontinued in 1980. The tank was cleaned out by a contractor and the contents were disposed of. Based on a June, 1979 tank sample analysis for 23 major pesticides, no pesticides were detected. However, based on earlier tank usage, pesticides would be expected at low concentrations. Due to the nature of the wastes stored at this site and

FIGURE 4.3


HANCOCK FIELD
STORAGE
AREAS
S-1
TRANSFORMER
STORAGE
?-1980
S-2
HAZARDOUS
MATERIAL
STORAGE SITE
(Bldg. 759)
1980-
PRESENT
S-3
ENTOMOLOGY
UNDERGROUND
STORAGE TANK
1978-1980
TAFT ROAD
THOMPSON ROAD
WATERTOWN
ROAD
HANCOCK DRIVE
Housing Area
STEWART DRIVE W.
DOVER AVE.
AIR FORCE INSTALLATION BOUNDARY
AIRPORT ROAD
INTERSTATE 81
Tributary To Mud Creek
Tributary To Beartrap Creek
Ley Creek (North Branch)
E-W Instrument Runway
AVENUE D
BULLARD AVENUE
16TH STREET
AIR NATIONAL GUARD INSTALLATION BOUNDARY
10
28
32
14
SCALE
0
500
1000
1500
FEET
N
SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

the potential for ground-water infiltration a potential for leakage and subsequent contaminant migration exists.

Disposal Sites

Prior to 1974, the majority of general refuse, hardfill and construction rubble generated at Hancock Field was disposed of at various landfill sites on Hancock Field. Since 1974 the general refuse has been disposed of at the municipal landfill.

Minimal records exist regarding the disposal sites at Hancock Field. The majority of information regarding these sites was collected through personnel interviews with current and retired employees. A description and evaluation of each site is presented herein. Table 4.5 summarizes pertinent information for each of the disposal sites illustrated in Figure 4.4.

Site D-1 Disposal Site

Site D-1 is located east of Watertown Road and south of Stewart Drive just north of the rifle range. This approximate 10 acre site was used for construction rubble disposal as well as general refuse disposal from the 1960's to 1979. Prior to the early 1960's the location was used as a waste treatment lagoon. Minor quantities of pesticides sludges from treatment of sanitary waste settled out in two settling ponds at this site. This disposal site may have contained some partially empty drums of waste solvents or pesticides in minor quantities. Since Site D-1 contains a large quantity of general refuse, potentially minor quantities of hazardous waste and is located in an area of high groundwater a potential for contaminant migration exists. The site is presently closed with several feet of local soil cover and contains grass and brush overgrowth. No evidence of vegetative stress or leachate exists.

Site D-2 Disposal Site

Site D-2 is located just south of Stewart Drive near the Fire Station. This three acre site contained 20'-25' of fill depth with construction rubble and hardfill material. The original site was a wetland area. In 1973 a waste slaked lime material from Linde Corporation was disposed of at this site as well as at other sites by the landfill operations contractor, Santaro Tarosen Company. This material consisted of 89.93 percent calcium hydroxide, 2.8 to 5.7 percent calcium carbonate, 1-.5 percent ferrous and aluminum oxides, 1.5 percent silicon oxides, 0.4

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Prior to 1974, the majority of general refuse, hardfill and construction rubble generated at Hancock Field was disposed of at various landfill sites on Hancock Field. Since 1974 the general refuse has been disposed of at the municipal landfill.

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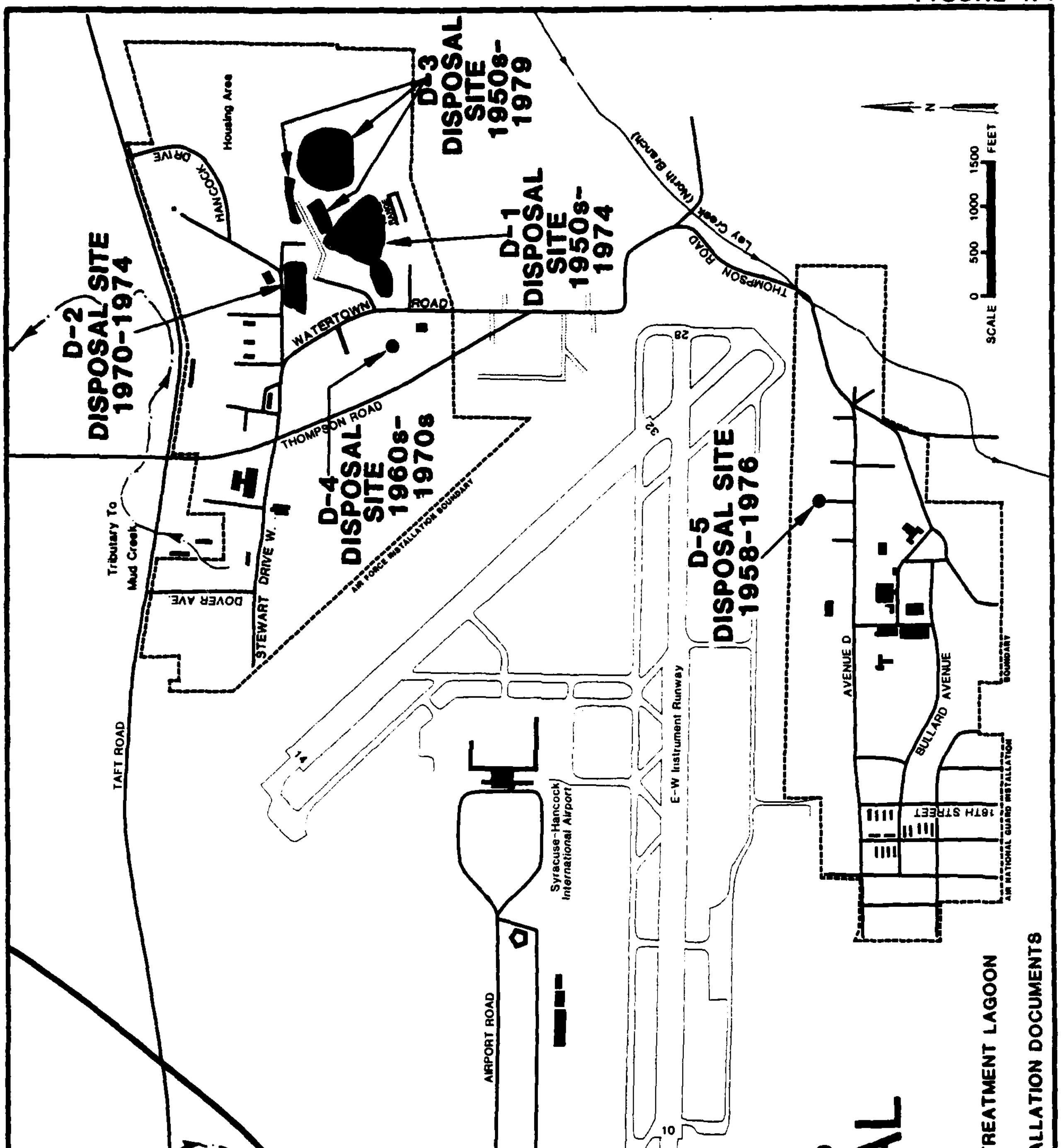
Site D-2 Disposal Site

Site D-2 is located just south of Stewart Drive near the Fire Station. This three acre site contained 20'-25' of fill depth with construction rubble and hardfill material. The original site was a wetland area. In 1973 a waste slaked lime material from Linde Corporation was disposed of at this site as well as at other sites by the landfill operations contractor, Santaro Tarosen Company. This material consisted of 89.93 percent calcium hydroxide, 2.8 to 5.7 percent calcium carbonate, 1-.5 percent ferrous and aluminum oxides, 1.5 percent silicon oxides, 0.4

TABLE 4.5
SUMMARY OF LANDFILL AND DISPOSAL SITES

Site No.	Site Name	Period of Operation	Approximate Area (Acres)	Suspected Types Of Waste	Method of Operation	Closure Status	Surface Drainage	Geological Setting
D-1	Disposal Site	1950's-1974	10	General refuse, garbage, construction rubble, hardfill, empty containers, waste treatment sludge	Area Fill - 2'-5' lift depths - total fill depth 20'	Closed with several feet of local soils - grass cover	To Ley Creek	Fine sandy loam, loamy fine sand, high water table
D-2	Disposal Site	1970-1974	3	Demolition wastes, slaked lime, hardfill and construction rubble	Area Fill	Closed with several feet of local soils - grass cover	To Ley Creek	Very fine sandy loam, and muck, high water table
D-3	Disposal Site	1950's-1979	12	General refuse, garbage, construction rubble, hardfill, empty containers, paint residues	Area Fill	Closed with several feet of local soils - grass cover	To Ley Creek	Loamy fine sand, fine sandy loam, high water table
D-4	Disposal Site	1950's-1960's	0.06	Hardfill and construction rubble	Area Fill	Closed with several feet of local soils - grass cover	To Ley Creek	Gravel pit
D-5	Disposal Site	1958-1976	0.35	Construction rubble, ammunition boxes, sod, empty drums, drums partially containing solvents or thinners (unconfirmed)	Area Fill 3'-4' depth	Closed with two feet of local soils cover - grass and wooded cover	To Ley Creek	Silty loam, high water table



HANCOCK FIELD
DISPOSAL SITES

NOTE: SITE D-1 WAS A WASTE TREATMENT LAGOON (1950s-1960s)

SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

percent magnesium carbonate and 0.3 percent carbon. This material had a pH of approximately 12, but is not hazardous from any other standpoint. The site is currently closed with several feet of local soil cover and does not present a potential for hazardous constituent migration.

Site D-3 Disposal Site

Site D-3 is actually three separate sites located east of Site D-1 and southwest of the housing area. This site was utilized for disposal of waste materials such as: slaked lime from Linde Corporation, construction rubble, hardfill, general refuse, empty drums and minor quantities of liquid paint residues. This site is located in a wet area with a high ground-water table and represents a potential for contaminant migration. The site is currently closed with several feet of local soils and a grass cover.

Site D-4 Disposal Site

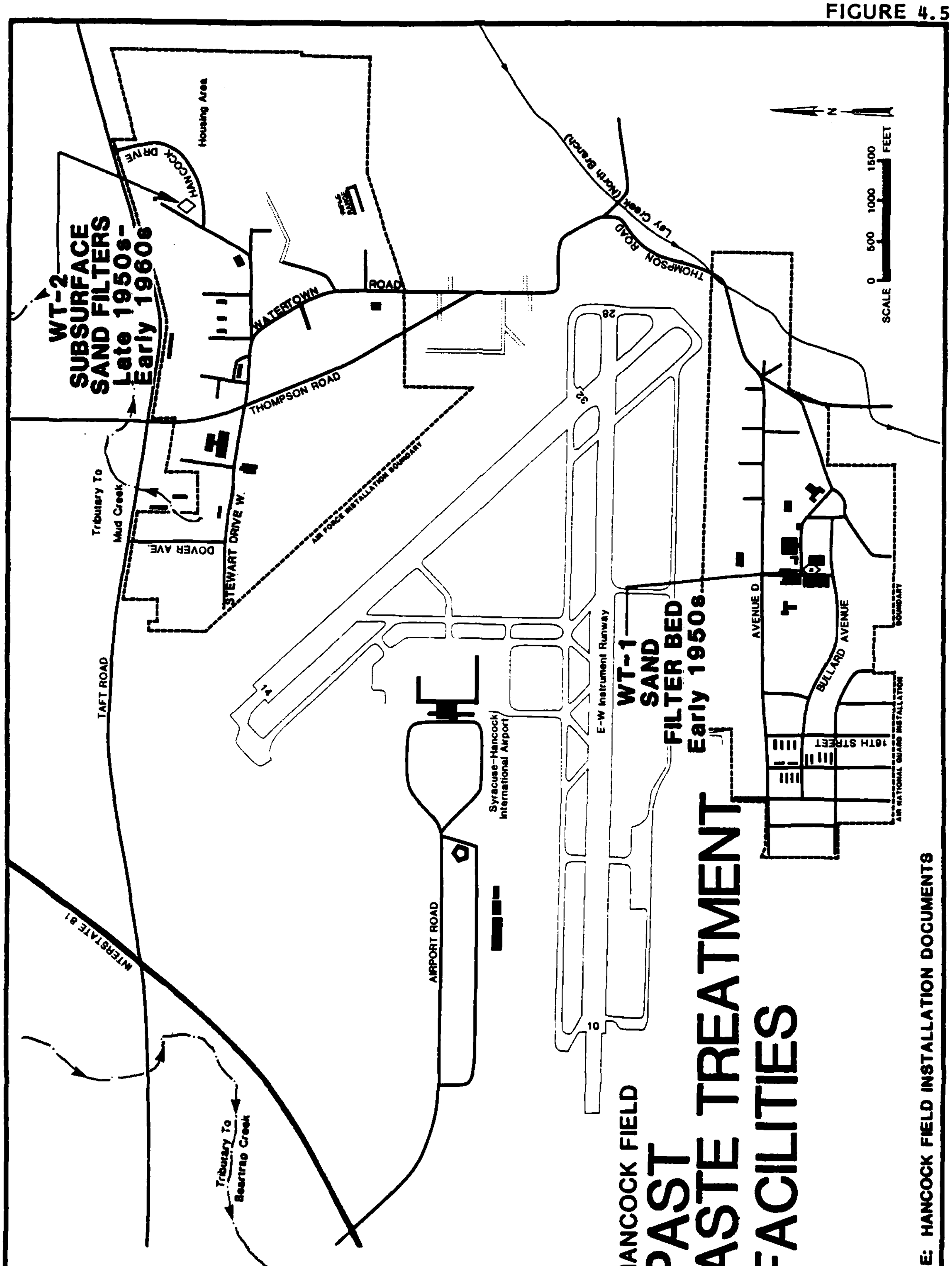
Site D-4 is located east of Thompson Road and south of Stewart Road. This small site was used primarily for disposal of construction rubble and hardfill material. No potential for migration of hazardous constituents exists at this site.

Site D-5 Disposal Site

Site D-5 is located near the "Old State Shack" at the end of the hardstand west of the present engine run-up area. This small site (100' x 150') contains construction rubble, ammunition boxes, empty drums and drums partially containing thinners or solvents. The specific waste types or quantities disposed at this site could not be determined although the materials most likely originated from the NYANG Shops. The site is closed with several feet of local soil. However, since the site is located in a high ground-water area and near the installation boundary a potential for hazardous contaminant migration exists.

Waste Treatment Systems

The locations of past waste treatment systems for sanitary wastes at Hancock Field are illustrated in Figure 4.5. A sand filter bed (WT-1) was used for Building 601 at the NYANG area in the early 1950's. A sand filter bed and leachate field (WT-2) was used for the Hancock Field in the late 1950's. Two waste treatment lagoons (Site D-1) (refer to Figure 4.4) were also used during the late 1950's and early 1960's. All of these sites have been closed and present a minor potential for migration of contaminants due to the sanitary nature of the wastes. At present



SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

most sanitary wastes are discharged to the Syracuse Municipal system.

<u>Septic Tanks</u>

There have been eight septic tanks located on Hancock Field. At present only four of these septic tanks are in operation. Based on the on-site survey, these units have been used primarily for disposal of sanitary sewage and should not pose a hazard from the standpoint of possible ground-water contamination.

<u>Oil/Water Separators</u>

There are three oil/water separators located at Hancock Field. One separator services the SAGE complex, one is in the Vehicle Maintenance Area and the other is in the NYANG area. The recovered oil is sold to an off-site contractor and the wastewaters enter the sanitary sewer. Based on the on-site survey those units should not pose a potential ground-water contamination hazard.

EVALUATION OF PAST DISPOSAL ACTIVITIES AND FACILITIES

The review of past operation and maintenance functions and past waste management practices at Hancock Field has resulted in the identification of seven sites potentially containing hazardous waste materials and having the potential for migration of contaminants. Other sites were reviewed and eliminated from further evaluation based on the logic presented in the decision tree shown in Figure 1.1.

The seven sites have been assessed using a hazardous assessment rating methodology (HARM) which takes into account characteristics of potential receptors, waste characteristics, pathways for migration and specific characteristics of the site related to waste management practices. The details of the HARM procedures are presented in Appendix G and the results of the assessment are summarized in Table 4.6. The rating system is designed to indicate the relative need for follow-on action. The information presented in Table 4.6 is intended as a guide for assigning priorities for further evaluation of the Hancock Field disposal areas under IRP Phase II. The rating forms for the individual waste disposal sites on Hancock Field are presented in Appendix H. Photographs of some of the key disposal sites and fire training areas are contained in Appendix F.

TABLE 4.6
PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES
HANCOCK FIELD

Site	Site Name	Period of Operation	Receptor Subscore	Pathways Subscore	Waste Management Subscore	Waste Characteristics Subscore	Overall Score	Refer to Appendix Page No.
FT-1	Fire Training Area	1948-Present	42	80	67	80	67	H-2
D-3	Disposal Site	1950's-1979	49	81	60	50	57	H-4
D-1	Disposal Site	1950's-1974	47	81	59	50	56	H-6
D-5	Disposal Site	1958-1976	47	81	56	40	56	H-8
S-1	Transformer Storage Area	? - 1980	42	81	54	40	54	H-10
S-3	Entomology Underground Storage Tank	1978-1980	49	74	54	40	51	H-12
SP-1	Old Spill Area	1956-1973	49	100	55	20	6	H-14

SECTION 5

CONCLUSIONS

SECTION 5

CONCLUSIONS

The goal of Phase I of the IRP is to identify the potential for environmental contamination from past waste disposal practices at Hancock Field and to assess the probability of contaminant migration. Based on the results of the project team's field inspection, review of records and files, and interviews with base personnel, past employees and state and local government employees, the conclusions given below have been developed. The conclusions are listed by category for the sites identified on Hancock Field. Table 5.1 contains the priority ranking of potential contamination sources at Hancock Field.

1) Fire Training Area

Fire training area FT-1 has a high potential for environmental contamination. Training exercises at FT-1 which have been conducted since 1948 have utilized waste oils, solvents, paint thinners and JP-4. This area is unlined. Based on visual inspection the site soils were contaminated with waste oil residue and there was also evidence of contaminated runoff in the swampy depression north of the fire training area. Fire training area FT-1 was given an overall score of 67.

2) Disposal Sites

Disposal site D-3 landfill which is closed with local soil cover and contains minor quantities of paint thinner residue has a moderate potential for environmental contamination. The site received a score of 57.

Disposal site D-1 landfill, which is closed with local soil cover and contains past waste treatment lagoon sludge, general refuse and potentially minor quantities of miscellaneous hazardous waste has a moderate potential for environmental contamination. The site received a score of 56.

Disposal site D-5, which is closed with local soil cover, and probably contains a few drums of hazardous shop materials from past operations also has a moderate potential for environmental contamination. The site received a score of 56.

TABLE 5.1

PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES

Rank	Site Name	Score
1	FT-1 Fire Training Area	67
2	D-3 Disposal Site	57
3	D-1 Disposal Site	56
4	D-5 Disposal Site	56
5	S-1 Transformer Storage Area	54
6	S-3 Entomology Underground Storage Tank	51
7	Sp-1 Old Spill Area	6

Note: This ranking was performed according to the Hazardous Assessment Rating Evaluation Methodology described in Appendix G. Individual site rating forms are located in Appendix H.

3) <u>Hazardous Waste Storage Areas</u>

The transformer storage area (Site S-1) has a minor potential for environmental contamination due to the small quantities of waste spilled. The site received a score of 54.

The entomology underground storage tank (Site S-3) has a small potential for environmental contamination. The site received a score of 51.

4) <u>Spill Areas</u>

The old spill area near the SAGE building (Site Sp-1) is considered a minor potential for contaminant migration since the majority of oil contaminated soil was removed in 1973. The site received a score of 6.

SECTION 6

RECOMMENDATIONS

SECTION 6
RECOMMENDATIONS

In order to aid in the comparison of the seven sites on Hancock Field with those sites identified in the IRP at other Air Force Installations, a priority rating scale was developed for prioritizing IRP Phase II studies. The sites at Hancock Field of primary concern, based on their potential for environmental contamination, are listed in Table 6.1. Further investigation is recommended. Further investigation of the remaining sites is not recommended unless data collected from other locations indicate a potential problem could exist at one of these sites.

The following recommendations are made to further assess the potential for environmental contamination migration from past activities at Hancock Field. The recommended monitoring program for Phase II is summarized in Table 6.1.

1) The Fire Training Site FT-1 is considered to have a high potential for environmental contamination and monitoring of this site is recommended. It is recommended that a monitoring system consisting of one upgradient well and three downgradient wells should be installed. At this time, it is believed that wells comprising such a system will have a total depth on the order of 30 feet and be screened through the saturated thickness of the soil aquifer. The ground-water table is within a few feet of the ground surface at this site. At a minimum, the well samples should be analyzed for TOC, TOH, pH, and oil and grease to determine the presence of any suspected contaminants. These indicator parameters are sufficient to detect the types of contaminants anticipated at this site. If contaminants are detected using the indicator parameters then an expanded monitoring program will be required to identify specific hazardous constituents. In addition to the ground-water monitoring, a minimum of four surface water and four sediment samples should be collected in the runoff area to the north of the fire training site. These samples should be located in a grid pattern over the ponded area. These samples should be analyzed for TOC, TOH, pH and oil and grease.

TABLE 6.1
RECOMMENDED MONITORING PROGRAM FOR PHASE II
HANCOCK FIELD

Site	Rating Score	Recommended Monitoring	Comments
Fire Training Area Site FT-1	67	Install a monitoring well system consisting of one upgradient well and three downgradient wells to an approximate 30 feet depth. The wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for TOC, pH, TOH, and oil and grease. In addition, a minimum of four surface water and sediment samples should be collected in the runoff area north of the fire training area and analyzed for TOC, TOH, pH and oil and grease.	
Disposal Site Site D-3	57	Install a monitoring well system consisting of one upgradient well and three downgradient wells to an approximate 30 feet depth. These wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for the TOC, pH, TOH, and oil and grease. In addition, surface and sediment samples should be collected at 300 foot intervals along the landfill culvert to determine the presence of any suggested contaminants. The twelve samples should be analyzed for TOH, TOC and pH.	The upgradient well for Sites D-3 and D-1 should be the same well.
Disposal Site Site D-1	56	Install a monitoring well system consisting of one upgradient well and three downgradient wells to Otan approximate 30 feet depth. These wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for the TOC, pH, TOH, and oil and grease.	The upgradient well for Sites D-3 and D-1 should b the same well.
Disposal Site Site D-5	56	Install a monitoring well system consisting of one upgradient well and three downgradient wells to an approximate 30 feet depth. These wells should be screened through the saturated thickness of the soil aquifer. Analyze the samples for the TOC, pH, TOH, and oil and grease. In addition, a minimum of five surface water and five sediment samples should be collected and analyzed for TOC, TOH, and pH. The samples should be collected in the runoff area along the northern edge of the site and downstream of the site. The samples should be collected approximately 150 feet apart.	

2) Disposal Sites D-3, D-1 and D-5 are considered to have a moderate potential for migration of contaminants and monitoring of these sites is recommended. It is recommended that a monitoring system consisting of one upgradient well and three downgradient wells should be installed for each site. However, Sites D-3 and D-1 are in close proximity so that a common upgradient well should be used for these sites. At this time, it is believed that wells comprising such a system will have a total depth on the order of 30 feet and be screened through the saturated thickness of the soil aquifer. At a minimum, the well samples should be analyzed for TOC, TOH, pH and oil and grease to determine the presence of any suspected contaminants. Surface water samples and sediment samples should also be collected at Sites D-3 and D-5 as described in Table 6.1.

APPENDICES

APPENDIX A

PROJECT TEAM QUALIFICATIONS

- J. R. Absalon, C.P.G.
- W. G. Christopher, P.E.
- R. M. Reynolds, P.E.

Biographical Data

JOHN R. ABSALON
Hydrogeologist

Personal Information

Date of Birth: 12 May 1946

Education

B.S. in Geology, 1973, Upsala College, East Orange, New Jersey

Professional Affiliations

Certified Professional Geologist (Indiana No. 46)
Association of Engineering Geologists
Geological Society of America
National Water Well Association

Experience Record

1973-1974	Soil Testing Incorporated-Drilling Contractors, Seymour, Connecticut. Geologist. Responsible for the planning and supervision of subsurface investigations supporting geotechnical, ground-water contamination, and mineral exploitation studies in the New England area. Also managed the office staff, drillers, and the maintenance shop.
1974-1975	William F. Loftus and Associates, Englewood Cliffs, New Jersey. Engineering Geologist. Responsible for planning and management of geotechnical investigations in the northeastern U.S. and Illinois. Other duties included formal report preparation.
1975-1978	U.S. Army Environmental Hygiene Agency, Fort McPherson, Georgia. Geologist. Responsible for performance of solid waste disposal facility siting studies, non-complying waste disposal site assessments, and ground-water monitoring programs at military installations in the southeastern U.S., Texas, and Oklahoma. Also responsible for operation and management of the soil mechanics laboratory.
1978-1980	Law Engineering Testing Company, Atlanta, Georgia. Engineering Geologist/Hydrogeologist. Responsible for the project supervision of waste management, water quality assessment, geotechnical, and hydrogeologic studies at commercial, industrial, and government

John R. Absalon (Continued)

facilities. General experience included planning and management of several ground-water monitoring programs, development of remedial action programs, and formulation of waste disposal facility liner system design recommendations. Performed detailed ground-water quality investigations at Robins Air Force Base in Georgia, a paper mill in southwestern Georgia, and industrial facilities in Tennessee.

1980-Date Engineering-Science. Hydrogeologist. Responsible for supervising efforts in waste management, solid waste disposal, ground-water contamination assessment, leachate generation, and geotechnical and hydrogeologic investigations for clients in the industrial and governmental sectors. Performed geologic investigations at eight Air Force bases and other industrial sites to evaluate the potential for migration of hazardous materials from past waste disposal practices. Conducted RCRA ground-water monitoring studies for industrial clients and evaluated remedial action alternatives for a county landfill in Florida.

Publications

"An Investigation of the Brunswick Formation at Roseland, NJ," 1973, with others, The Bulletin, Vol 18, No. 1, NJ Academy of Science, Trenton, NJ.

"Engineering Geology of Fort Bliss, Texas," 1978, with R. Barksdale, in Terrain Analysis of Fort Bliss, Texas, US Army Topographic Laboratory, Fort Belvoir, VA.

"Geologic Aspects of Waste Disposal Site Evaluations," 1980, with others, Program and Abstracts AEG-ASCE Symposium on Hazardous Waste Disposal, April 26, Raleigh, NC.

"Practical Aspects of Ground-Water Monitoring at Existing Disposal Sites," 1980, with R.C. Starr, Proceedings of the EPA National Conference on Management of Uncontrolled Hazardous Sites, HMCRI, Silver Spring, MD.

"Improving the Reliability of Ground-Water Monitoring Systems," 1981, Proceedings of the Madison Conference of Applied Research and Practice on Municipal and Industrial Waste, University of Wisconsin-Extension, Madison, WI.

Biographical Data

WILLIAM GARY CHRISTOPHER

Environmental Engineer

Personal Information

Date of Birth: 25 January 1953

Education

B.S.C.E. in Civil Engineering, (Magna Cum Laude), 1974
West Virginia University, Morgantown, W.Va.
M.E. in Environmental Engineering, 1975, University of Florida, Gainesville, Florida

Professional Affiliations

Registered Professional Engineer (Georgia No. 11886)
American Society of Civil Engineers (Associate Member)
West Virginia Water Pollution Control Federation

Honorary Affilitations

Chi Epsilon
Tau Beta Pi
EPA Traineeship for Master's Degree

Experience Record

1972-1974 West Virginia Department of Highways. Morgantown, West Virginia. Highway Co-op Technician. Handled inspection of drainage, concrete structures, earthwork and compaction testing for interstate highway construction within Monongalia County and Preston County. Performed field office assignments to finalize estimates and quantities for a completed section of highway construction.

1975-1977 Union Carbide Corporation, Chemicals and Plastics Division, Environomental Engineering Department. As a process/project engineer performed environmental protection engineering for Union Carbide's Taft and Texas City Plants. Projects included process design of a rapid mix-flocculation basin for the Gulf Coast Waste

2/82

William Gary Christopher (Continued)

Disposal Authority (GCWDA) 40-Acre Facility Treatment Plant. Performed bench-scale studies of coagulant use to improve settling of aeration basin effluent biosolids at the 40-acre facility. Predicted 40-acre facility effluent BOD and effluent TSS quality following operation changes to the existing facility including addition of a limited aeration basin to the front end of the treatment plant. Performed process feasibility and conceptual design of an aeration treatment facility for Union Carbide's Texas City plant concentrated waste stream. Performed preliminary process scope and cost appraisals for sludge disposal alternatives at Texas City including: landfarming, pressure filtration-landfill and pressure filtration-incineration. Performed settling column studies for solvent vinyl resin and suspension vinyl resin waste streams and sized settling basins from the studies. Proposed bench-scale study of the effect of ethyleneamines waste stream on anaerobic treatment of Texas City concentrated wastes. Provided review assistance for a 200-acre regional industrial landfill, in-place stabilization processes for 18-acre lagoons of primary sludge and pyrolysis fuel oil mixtures at Texas City, and source reduction projects. Evaluated at UNOX compressor piping modification for the Taft Plant to reduce power consumption by 50%. Wrote preliminary operational considerations for a proposed GCWDA regional landfarm.

1977-Date Engineering-Science, Inc. Project Engineer on study for the American Textile Manufacturers Institute and EPA. Responsible for field pilot plant study and evaluation of coagulation/clarification/multi-media filtration, carbon adsorption, ozonation, coagulation/multi-media filtration and dissolved air flotation technologies for treatment of textile industry "BPT" effluents to meet future BATEA guidelines. An ancillary portion of this project included review of existing activated sludge facilities and operational practices to meet current "BPT" limits at 5 textile mill sites.

Project engineer on study for Lederle Laboratories, Pearl River, New York plant. Responsible for wastewater treatment plant evaluation and optimization study with particular emphasis on operational changes to improve performance. Treatment processes included coagulation, flocculation, primary sedimentation, oxygen activiated sludge and final sedimentation.

William Gary Christopher (Continued)

Project manager of waste treatment operations evaluation at a pharmaceutical plant. Responsibilities included operational optimization of the full-scale activated sludge process with full-scale coagulation testing, bench-scale bioreactor studies and equalization mixing and capacity studies.

Project engineer on study to determine the impact of RCRA regulations on the coal-fired utility industry. Assisted in development of design criteria and cost methodology and estimates to compare the cost impact of RCRA 3004 and 4004 regulations on fly ash, bottom ash and FGD sludge disposal on a regional and nationwide basis.

Project Manager for review of a Permit Application and design for a proposed Hazardous Waste Disposal Facility in North Carolina.

Project Manager for preparation of a "white paper" for the Department of Energy to assess major impacts of proposed RCRA 3001, 3004 and 3006 regulations on industrial coal use for power generation.

Project Manager on study to determine biotreatability of new process wastes for a pharmaceutical chemical plant and to evaluate and define options for liquid waste incineration.

Project Manager on odor control study of process wastes for a major organic chemicals company. Responsible for laboratory bench-scale and field pilot plant study involving evaluation of liquid waste, air and steam stripping, chemical oxidation, ozonation, and activated carbon adsorption. Design criteria for a biological treatment system for the odor pretreatment effluent was also developed from bench-scale bioreactor studies.

Project Manager on a study to provide a preliminary evaluation of advanced waste treatment technologies required for upgrading an existing activated sludge facility treating organic chemical and pharmaceutical wastes with high COD and nitrogenous concentrations.

Project Manager on a biological treatability study to provide expanded waste treatment facilities for a major organic chemicals firm. Responsibilities included laboratory bench-scale and pilot scale treatability and sludge handling studies involving waste characterization, activated sludge treatability, aerobic digestion, gravity thickening, dissolved air flotation, belt filter press sludge dewatering, plate and frame pressure

William Gary Christopher (Continued)

filter, vacuum filter (rotary precoat), and centrifugation for nine different raw waste streams.

Project Manager for a project involving process selection and preliminary engineering design for a pulp and paper mill waste treatment facility.

Project Manager on Solid and Hazardous Waste study for a diverse chemicals and plastics production facility. Responsibilities included RCRA Interim Status Compliance, RCRA Manifest Implementation and plant training, RCRA Notification and Permit Part A applications. Detailed Solid Waste inventories by production unit and classification of wastes according to RCRA were developed. Segregation of wastes, recycle/recovery and ultimate disposal options including incineration and secure landfills were evaluated for the short-term. Long-term evaluations will be considered in Phase II of the Study.

Project Manager on Solid and Hazardous Waste study for a diverse organic chemicals manufacturing facility. Long-term alternatives for storage, handling, treatment and disposal of a variety of types of hazardous wastes were evaluated based on technical performance and economic comparisons. Alternatives evaluated included solid and liquid incineration, landfill, landfarm, solidification/fixation, and physical volume reduction (shredding,compaction). Developed a detailed Spill Control and Best Management Practices Manual.

Project Manager for a waste treatment plant capacity evaluation for a silicon wafer manufacturing facility. Bench-scale and pilot scale coagulation and settling column studies were performed in addition to field scale oxygen transfer tests to predict maximum design organic and hydraulic loadings for an existing activated sludge waste treatment facility.

Project manager for a biological treatability study to determine the optimum conditions (temperature and hydraulic residence time) for removal of a specific organic currently produced at a chemical production facility.

Project manager for three Installation Restoration Programs (IRP) Phase I projects for the U.S. Air Force (Kelly AFB, Eglin AFB, Duluth AFB,). Each of these projects utilized a project team of various disciplines (geology, chemical engineering, biology, environmental engineering) to assess the potential for environmental contamination migration resulting from

William Gary Christopher (Continued)

past hazardous waste handling, storage, treatment and disposal practices. The project tasks included environmental audits, development of waste inventories and waste classification, assessment of site environmental setting, assessment of past waste handling practices (surface impoundments, landfills, storage areas, fire training areas) and finally priority ranking of sites and recommendations for Phase II groundwater monitoring programs.

Project manager for a preliminary design for upgrading an existing activated sludge facility (175,000 gpd) to accommodate expanded pharmaceutical and chemical production facilities. The modifications included provisions for additional submerged aeration capacity, solids contact clarification and mixed equalization.

Other recent projects include development of the work plan and experimental program for an American Cyanamid Company organic chemical plant primary treatment study, development of design specifications for a pharmaceutical production facility waste treatment plant and mixed liquor coagulation operations assistance for a plastics production waste treatment facility.

Technical Publications

"Magnesium Recovery from a Neutral Sulfite Semi-chemical Pulp and Paper Mill Sludge," Master of Engineering Research Project, University of Florida, Gainesville, Florida 1975.

"Siting Considerations for Hazardous Waste Disposal Facilities," presented at the Georgia Environmental Health Association Conference, Jekyll Island, Georgia, July, 1981. (Co-author T.N. Sargent)

W. G. Christopher, "Hazardous Waste Management," Seminar presented to Capitol Associated Industries, Inc., Raleigh, North Carolina, August 21, 1981

W. G. Christopher, "A Solid and Hazardous Waste Management Program for Industrial Facilities," Industrial Wastes Magazine (publication pending), 1982.

W. G. Christopher, "Ground-Water Monitoring" Seminar and Workshop presented to the State of Mississippi, Bureau of Pollution Control, Jackson, Mississippi, February 16-17, 1982. (Co-presentors - J. R. Absalon, E.J. Schroeder).

W. G. Christopher, "Assessment of Hazardous Waste Disposal Sites," (Publication Pending), 1982. (Co-author J.R. Absalon).

Biographical Data

Randal M. Reynolds

Senior Engineer

Person. Information

Date of Birth: 21 December 1949

Education

BChE (Chemical Engineering), 1973, Georgia Institute of Technology, Atlanta, Georgia

Professional Affiliations

Registered Professional Engineer, Georgia #13023
Air Pollution Control Association
American Institute of Chemical Engineers (Chapter Chairman)

Experience Record

1973-1975 U.S. Environmental Protection Agency, Water Enforcement Branch, Atlanta, Georgia. Chemical Engineer. Responsible for developing draft NPDES limitations for industrial discharges, issuing public notices and final NPDES permits and participating in public hearings concerning NPDES permits.

1975-1981 Gold Kist Inc., Corporate Engineering, Atlanta, Georgia. Environmental Process Engineer. Responsible for reviewing and implementing new air quality, NPDES, RCRA and TSCA regulations. Supervised preparation and submittal of air quality, water quality and hazardous waste permit applications. Kept management informed of impact of regulations on existing and future projects.

Served as staff engineer responsible for preparing preliminary designs for air pollution control systems and detailed cost estimates for air system capital projects. Major projects included the preliminary selection of alternatives for a particulate emission control system for a 60,000 lbs/hr industrial steam boiler (peanut hull/wood fired).

1981-Date Engineering-Science, Inc., Atlanta, Georgia. Senior Engineer. Responsibility for developing environmental studies and alternative evaluations for clients.

Randal M. Reynolds, Continued

Project Engineer for Phase I Installation Restoration Program projects for the Department of Defense. Conducted interviews of past and present employees, examined records, and performed site investigations to determine hazardous chemical usage, waste generation and waste disposal practice timelines for industrial operations at several Air Force bases. Through environmental audit procedures, identified industrial operation disposal practices which could result in waste migration and recommended priority disposal practices requiring further investigation.

Project Engineer assisting in a comprehensive study of the solid waste management program for the City of Roswell, Georgia. Developed conceptual cost estimates for a city operated sanitary landfill and incinerator disposal alternatives.

Project Manager for development of a Spill Prevention Control and Countermeasures (SPCC) Plan for an industrial facility. Coordinated the design of spill containment structures and recommended structure modifications. Recommended essential spill control and clean-up equipment.

Publications and Presentations

R. M. Reynolds, "Practical Tips - Bagging Sludge?", Pollution Engineering, Vol. 12, No. 7, July 1980, pg. 28.

R. M. Reynolds, "Pulse-Type Fabric Filters in a Soybean Processing Facility," Operation and Maintenance of Air Particulate Control Equipment, R. A. Young, F. L. Cross, Jr., editors, Ann Arbor Science Publishers, Inc., Ann Arbor, Michigan, July 1980, pp. 121-123.

"Operation, Maintenance and Design of Fabric Filters for a Soybean Processing Facility," a slide presentation for the EPA technology transfer serminar, "Operation and Maintenance of Air Pollution Equipment for Particulate Control," April 12, 1979, Atlanta, Georgia.

APPENDIX B

INSTALLATION HISTORY & TENANT MISSIONS

APPENDIX B

INSTALLATION HISTORY AND TENANT MISSIONS

INSTALLATION HISTORY[1]

Hancock Field was named for Clarence E. Hancock, a prominent local citizen, and member of the United States House of Representatives.

In contrast to its air defense mission of today, Syracuse Army Air Base, as it was then known, was built and activated in 1942, during the early days of World War II, as a staging area for warplanes bound for England.

Many of the "hardstands" and taxiways now lying dormant were scenes of feverish activity 35 years ago when B-17s, B-24s, transports and many other types of aircraft were being prepared for the long hop across the North Atlantic.

One of the first units to pass through Hancock Field was the 305th Bombardment Group, flying B-17s and led by Col. Curtis E. LeMay, who later became the Air Force Chief of Staff.

Army Air Forces left Hancock Field in 1946 with the 138th Fighter Squadron of the New York Air National Guard remaining as the sole military occupant of the field until the Air Force returned in 1952 with the Headquarters of the 32nd Air Division. Building 3, the present Base Headquarters, was built as the blockhouse for the 32nd pre-SAGE manual division under the Eastern Air Defense Force. The 32nd was phased out and replaced by the 26th Air Division (SAGE) when the SAGE system became operational on January 1, 1959. At approximately the same time, the Syracuse Air Defense Sector became operational. ("SAGE" stands for "semi-automatic ground environment," an air defense system in which air surveillance data is processed for transmission to computers at regional control centers.)

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(1) Installation History Source: Base Level Resource Statement. 4789th Air Base Group. Hancock Field, New York. September, 1981.

AD-A118 635 ENGINEERING-SCIENCE INC ATLANTA GA F/G 13/2
INSTALLATION RESTORATION PROGRAM. PHASE I. RECORDS SEARCH, HANC--ETC(U)
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In September 1963, the 26th Air Division Headquarters was moved to Stewart AFB, N.Y., and the Syracuse Sector, in a realignment of sector boundaries, became the Boston Air Defense Sector.

On April 1, 1966, a reconfiguration of the Air Defense Command renamed the Boston Air Defense Sector as the 35th Air Division, with headquarters remaining at Hancock Field.

In November 1969, in another Aerospace Defense Command realignment, the 35th Air Division was deactivated and replaced by the 21st NORAD Region/Air Division, with headquarters again at Hancock Field.

The newest realignment, occurred in mid 1979, placed the 21st Air Division under Tactical Air Command. Earlier in the year, the 21st ADCOM Region was created. Hancock Field will now serve as headquarters for the 21st NORAD Region, the 21st ADCOM Region and the 21st Air Division.

TENANT MISSIONS

Missions of the major tenant organizations on the installation during the last several years are briefly described in the following paragraphs.

4789th Air Base Group is the host unit at Hancock which provides full housekeeping facilities for the 21st NORAD Region/Air Division headquarters. The group is responsible for the welfare of men and women assigned to the installation.

21st Air Defense Squadron (21ADS) provides administrative services and personnel for the Region/Division headquarters. It is the unit of assignment for SAGE technicians and utility workers.

Detachment 27, 12th Weather Squadron (MAC) provides weather support to both the 21st Air Division and Hancock Field.

USACC-NETSC - The U.S. Army Communications Command's Northeast Telecommunications Switching Center provides automatic record message service worldwide as an integral part of the Defense Communications Agency's Digital Information Network.

Detachment 103, 3501st Recruiting Group (ATC), serves as the administrative and operational headquarters for recruiting personnel in offices throughout central and western New York.

The 174th Tactical Fighter Wing (NYANG) Group was officially organized on October 28, 1947, as the first Air Guard flying unit in the

state. Now on inactive duty status, the 174th is continuously participating in coordinated exercises with other Air Guard units and other branches of the Armed Forces.

Detachment 110, Office of Special Investigation (OSI) provides counter-intelligence, criminal and special investigative service for all Air Force activities. Analyzes, collects, and disseminates information of counter-intelligence significance and collects and reports information pertinent to base security.

The USAF Clinic provides outpatient medical care for military members assigned to Hancock, and their dependents. No in-patient care is available. The facility operates a Screening Clinic and a daily military sick call. Additional services include laboratory, x-ray, pharmacy, immunizations and optometry. Physical examinations for non-military persons are not available. Military personnel are normally hospitalized in the VA Hospital in Syracuse or the USAF Hospital at Griffiss AFB. Dependents use the CHAMPUS Program and are hospitalized in civilian hospitals in Syracuse.

APPENDIX C

SUPPLEMENTAL ENVIRONMENTAL SETTING INFORMATION

APPENDIX C

SUPPLEMENTAL ENVIRONMENTAL SETTING INFORMATION

BIOLOGICAL RESOURCES

The following information regarding the Hancock Field biological resources was obtained from the Tab A-1, Environmental Narrative, March 1979.

Hancock Field encompasses 189 acres of improved land, 40 acres of semi-improved land and 176 acres of unimproved land area. The base contains no aquatic plants, field crops or threatened or endangered plant species.

There are no threatened or endangered animal species existing on-base.

SUMMARY OF SURFACE WATER QUALITY DATA

A summary of surface water monitoring data is shown in Table C.1. Table C.2 describes the NYDEC wetland classifications.

INVENTORY OF PESTICIDES

A list of pesticides currently in use on the installation is shown in Table C.3.

TABLE C.1
SUMMARY OF SURFACE WATER QUALITY DATA[(1)]

Parameters/Units	No. 001 AVG	No. 001 MAX	No. 002 AVG	No. 002 MAX	No. 003 AVG	No. 003 MAX	No. 004 AVG	No. 004 MAX	No. 005[(2)] (active) AVG	No. 005[(2)] (active) MAX	No. 005 (inactive) AVG	No. 005 (inactive) MAX	No. 006 (inactive) AVG	No. 006 (inactive) MAX	No. 007 (inactive) AVG	No. 007 (inactive) MAX	Drinking[(3)] Water Standards MAX
Ammonia, mg/l	0.4	0.5	<0.2	0.3	<0.2	0.4	<0.2	0.3	--	0.6	<0.2	2.1	<0.2	<0.2	<0.2	<0.2	NA
Nitrite as N mg/l	<0.02	1.72	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	--	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NA
Nitrate as N, mg/l	2.3	6	<0.01	0.5	0.5	2	0.8	2	--	<0.01	<1	2	<1	1	<1	1	10
Oil & Grease, mg/l	0.6	1.4	0.5	1.0	0.9	2.0	0.7	1.8	--	<0.3	0.8	2	0.6	0.8	0.7	0.8	NA
Total Organic Carbon, mg/l	6	12	9	15	3	5	16	53	--	9	8	19	6	15	7	15	NA
Total Phosphorus, mg/l	1.12	2.9	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	0.6	<0.1	0.4	NA
Total Cyanide, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA
Phenols, µg/l	<10	10	<10	<10	<10	<10	<10	<10	--	<10	<10	<10	<10	<10	<10	<10	NA
Copper, µg/l	62	154	88	300	81	267	46	135	--	<50	<20	40	<20	100	<20	140	1,000
Iron, µg/l	985	4,298	553	990	457	1,023	803	2,350	--	1,830	428	1,180	1,032	3,650	<100	190	300
Manganese, µg/l	225	355	129	177	71	98	121	240	--	162	70	410	<50	<50	<50	<50	50
Zinc, µg/l	248	592	<50	60	<50	50	<50	120	--	<50	<50	90	<50	70	<50	60	5,000
Calcium, mg/l	97	149	90	115	71	95	91	110	--	99	82	108	77	110	74	105	NA
Chlorides, mg/l	71	128	61	100	14	52	68	100	--	5.68	46	72	40	64	45	96	250
Fluorides, mg/l	1.6	3.8	0.4	0.8	0.3	0.5	0.2	0.4	--	0.19	0.2	0.3	<0.1	0.3	<0.1	0.3	2.4
Sulfates, mg/l	138	375	100	150	25	40	115	200	--	59	62	115	92	150	63	115	250
Surfactants mg/l	<0.1	0.7	<0.1	3.2	<0.1	0.2	<0.1	<0.1	--	1.96	<0.1	0.2	<0.1	0.4	<0.1	0.35	NA
pH, std units	7.2	7.8	7.8	8.0	7.5	8.0	7.0	8.5	--	6.8	7.5	7.9	7.6	7.8	7.6	7.8	8.5
Temperature, °C	17	18	14	18	13	16	15	19	--	7	--	--	--	--	--	--	NA

(1) See Table 3.3 and 3.4 for sampling station location descriptions.

(2) Normal dry stream. One sample data set available.

(3) EPA Interim Primary or Proposed Secondary Drinking Water Standards

(4) Sample No. 001-005: Sampling Period: 1981-Present

(5) Sample No. 005 (active) No. 007: Sampling Period: ????-1978

TABLE C.2

NYDEC WETLAND CLASSIFICATIONS

664.5 Classification system.

Not all wetlands supply equally the benefits explained in section 664.3(b). The degree to which wetlands supply benefits depends upon many factors, including: their vegetative cover, their ecological associations, their special features, their hydrological and pollution control features, and their distribution and location; and these may vary considerably from wetland to wetland.

Because of this variation, the act requires the commissioner to classify wetlands in a way that recognizes that not all wetlands are of equal value. This section establishes four ranked regulatory classes of wetlands, depending upon the degree of benefits supplied. The benefits cited in section 24-0105(7) of the act are translated into discernible wetland characteristics, and these characteristics are used to classify wetlands. Section 664.6 describes each characteristic in some detail and discusses the benefits supplied by a wetland when it contains that characteristic.

(a) Class I wetlands.

A wetland shall be a Class I wetland if it has any of the following seven enumerated characteristics:

Ecological associations

(1) it is a classic kettlehole bog (664.6(b)(2));*

Special features

(2) it is resident habitat of an endangered or threatened animal species (664.6(c)(2) and (4));

(3) it contains an endangered or threatened plant species (664.6(c)(4));

(4) it supports an animal species in abundance or diversity unusual for the state or for the major region of the state in which it is found (664.6(c)(1) and (6));

Hydrological and pollution control features

(5) it is tributary to a body of water which could subject a substantially developed area to significant damage from flooding or from additional flooding should the wetland be modified, filled, or drained (664.6(d)(1));

(6) it is adjacent or contiguous to a reservoir or other body of water that is used primarily for public water supply, or it is hydraulically connected to an aquifer which is used for public water supply (664.6(d)(2), (3), and (4)); or

Other

(7) it contains four or more of the enumerated Class II characteristics. The department may, however, determine that some of the characteristics are duplicative of each other, therefore do not indicate enhanced benefits,

* The reference in parentheses after each characteristic is to the description of that characteristic and its associated benefits in section 664.6.

and so do not warrant Class I classification. Each species to which paragraphs 664.5(b)(6) through (8) apply shall be considered a separate Class II characteristic for this purpose.

(b) <u>Class II wetlands</u>.

A wetland shall be a Class II wetland if it has any of the following seventeen enumerated characteristics:

<u>Covertype</u>

(1) it is an emergent marsh in which purple loosestrife and/or reed (phragmites) constitutes less than two-thirds of the covertype (664.6(a)(2));*

<u>Ecological association</u>

(2) it contains two or more wetland structural groups (664.6(b)(1));

(3) it is contiguous to a tidal wetland (664.6(b)(3));

(4) it is associated with permanent open water outside the wetland (664.6(b)(4));

(5) it is adjacent or contiguous to streams classified C(t) or higher under article 15 of the environmental conservation law (664.6(b)(5));

<u>Special features</u>

(6) it is traditional migration habitat of an endangered or threatened animal species (664.6(c)(3) and (4));

(7) it is resident habitat of an animal species vulnerable in the state (664.6(c)(2) and (5));

* The reference in parentheses after each characteristic is to the description of that characteristic and its associated benefits in section 664.6.

(8) it contains a plant species vulnerable in the state (664.6(c)(5)):*

(9) it supports an animal species in abundance or diversity unusual for the county in which it is found (664.6(c)(7));

(10) it has demonstrable archaeological or paleontological significance as a wetland (664.6(c)(8));

(11) it contains, is part of, owes its existence to, or is ecologically associated with, an unusual geological feature which is an excellent representation of its type (664.6(c)(9));

Hydrological and pollution control features

(12) it is tributary to a body of water which could subject a lightly developed area, an area used for growing crops for harvest, or an area planned for development by a local planning authority, to significant damage from flooding or from additional flooding should the wetland be modified, filled, or drained (664.6(d)(1));

(13) it is hydraulically connected to an aquifer which has been identified by a government agency as a potentially useful water supply (664.6(d)(4));

(14) it acts in a tertiary treatment capacity for a sewage disposal system (664.6(d)(3));

Distribution and location

(15) it is within an urbanized area (664.6(e)(1));

* The reference in parentheses after each characteristic is to the description of that characteristic and its associated benefits in section 664.6.

(16) it is one of the three largest wetlands within a city, town, or New York City borough (664.6(e)(3));* or

(17) it is within a publicly owned recreation area (664.6(e)(4)).

(c) <u>Class III wetlands</u>.

A wetland shall be a Class III wetland if it has any of the following fifteen enumerated characteristics:

<u>Covertypes</u>

(1) it is an emergent marsh in which purple loosestrife and/or reed (phragmites) constitutes two-thirds or more of the covertype (664.6(a)(2));

(2) it is a deciduous swamp (664.6(a)(3));

(3) it is a shrub swamp (664.6(a)(5));

(4) it consists of floating and/or submergent vegetation (664.6(a)(6));

(5) it consists of wetland open water (664.6(a)(7));

<u>Ecological associations</u>

(6) it contains an island with an area or height above the wetland adequate to provide one or more of the benefits described in section 664.6(b)(6);

<u>Special features</u>

(7) it has a total alkalinity of at least 50 parts per million (664.6(c)(10));

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* The reference in parentheses after each characteristic is to the description of that characteristic and its associated benefits in section 664.6.

(8) it is adjacent to fertile upland (664.6(c)(11));*

(9) it is resident habitat of an animal species vulnerable in the major region of the state in which it is found, or it is traditional migration habitat of an animal species vulnerable in the state or in the major region of the state in which it is found (664.6(c)(1), (2), (3), and (5));

(10) it contains a plant species vulnerable in the major region of the state in which it is found (664.6(c)(1) and (5));

Hydrological and pollution control features

(11) it is part of a surface water system with permanent open water and it receives significant pollution of a type amenable to amelioration by wetlands (664.6(d)(3));

Distribution and location

(12) it is visible from an interstate highway, a parkway, a designated scenic highway, or a passenger railroad and serves a valuable aesthetic or open space function (664.6(e)(2));

(13) it is one of the three largest wetlands of the same covertype within a town (664.6(e)(3));

(14) it is in a town in which wetland acreage is less than one percent of the total acreage (664.6(e)(3)); or

(15) it is on publicly owned land that is open to the public (664.6(e)(5)).

* The reference in parentheses after each characteristic is to the description of that characteristic and its associated benefits in section 664.6.

(d) Class IV wetlands.

A wetland shall be a Class IV wetland if it does not have any of the characteristics listed as criteria for Class I, II or III wetlands. Class IV wetlands will include wet meadows (664.6(a)(1))* and coniferous swamps (664.6(a)(4)) which lack other characteristics justifying a higher classification.

TABLE C.3

LIST OF PESTICIDES CURRENTLY IN USE

CHEMICAL NAME	COMMON NAME
Phenyl Methylcarbamate	Baygon
Octachloro-4, 7-Methanotetra Hydroindane	Chlordane
P, P-Diethyl-0-(2-Isopropyl-6-Methyl-5-Pyrimidinyl) Phosphorothioate	Diazinon
(None Determined)	D-Tox
0,0-Diethyl-0-(3,5,6-Trichloro-2-Pyridyl) Phosphorothioate	Dursban 4E, Dursban 10CR
Gama-1,2,3,4,5,6-Hexachlorocyclohexane	Lindane
0,0-Dimethyl Phosphorodithioate Ester of Diethyl Mercaptosuccinate	Malathion
Naphthalene	Naphthalene
(None Determined)	Octagon
2-Pivalyl-1,3-Indandione	Pivayl
Pyrethrins	Pyrethrins
Pyrethrums	Pyrethrums
([5-(phenylmethyl)-3-furanyl]methyl 2,2-dimethyl-3-(2-methyl-1-propenyl) cyclopropanecarboxylate.)	Resmethrin
N-(Phosphonomethyl) Glycine (Isopropylamine Salt)	Round-Up
1-Naphthalenol Methylcarbamate	Sevin

APPENDIX D
MASTER LIST OF INDUSTRIAL SHOPS

APPENDIX D

MASTER LIST OF INDUSTRIAL SHOPS

Name	Present Location (Bldg. No)	Handles Hazardous Materials	Generates Hazardous Wastes	Past T.S.D.
21 Air Defense Squadron				
SAGE Utilities	503	Yes	Yes	Contractor
4789 Air Base Group (ABG)/Civil Engineering				
Carpentry Shop	266	Yes	No	Consumed in Process
Plumbing Shop	266	Yes	No	Consumed in Process
Paint Shop	266	Yes	Yes	On-Base Landfill
Heat Systems Shop	34	Yes	No	Consumed in Process
Entomology Shop	259	Yes	Yes	On-Site Storage
Pavement and Grounds	267	Yes	Yes	Contractor
4789 ABG/Logistics Section				
Base Reproduction	501	Yes	No	Consumed in Process
Audio Visual Services	3	Yes	Yes	Sanitary Sewer
Vehicle Maintenance	442	Yes	Yes	Contractor
Fuels Management	5	Yes	Yes	Contractor
4789 ABG/Morale, Welfare and Recreation				
Auto Hobby Shop	5	Yes	Yes	Contractor
Wood Hobby Shop	252	No	No	Consumed in Process
USAF Clinic Hancock				
Medical Lab	254	Yes	No	Consumed in Process
Medical X-Ray	254	Yes	Yes	Sanitary Sewer
Dental Lab	250	Yes	Yes	Sanitary Sewer

APPENDIX D

MASTER LIST OF INDUSTRIAL SHOPS (Continued)

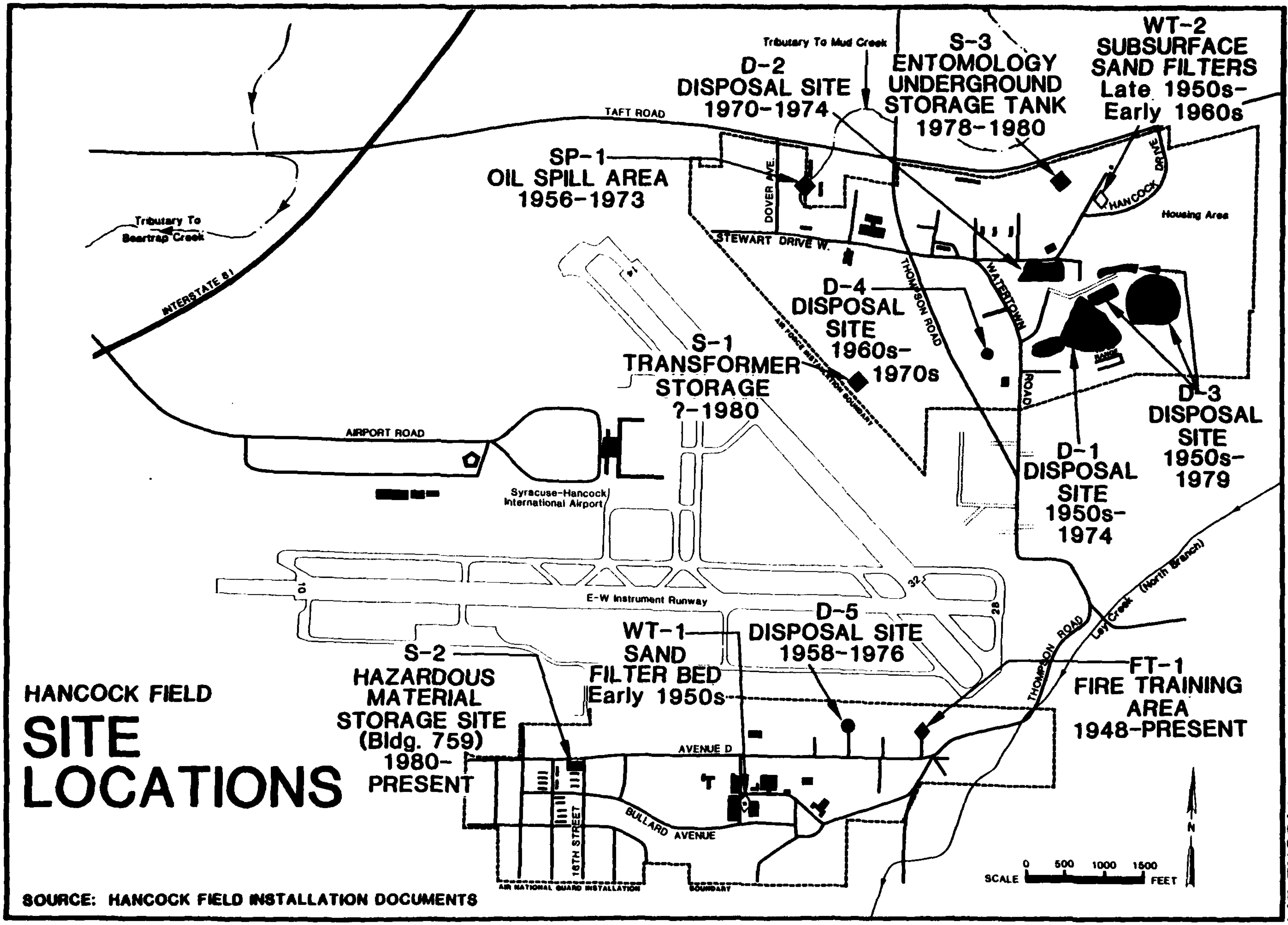
Name	Present Location (Bldg. No)	Handles Hazardous Materials	Generates Hazardous Wastes	Past T.S.D.
174 Air National Guard				
Organizational Maint.	629	Yes	Yes	Contractor
Field Maintenance	610	Yes	No	Consumed in Process
Corrosion Control	1600	Yes	Yes	Contractor
Non-Destructive Inspec.	610	Yes	Yes	Contractor
Engine Shop	607	Yes	Yes	Contractor
Tire Shop	610	Yes	Yes	Contractor
Pneudraulics Shop	610	Yes	Yes	Contractor
Fuels Systems Shop	610	Yes	Yes	Contractor
Aerospace Ground Equip.	601	Yes	Yes	Contractor
Avionics Shop	641	Yes	No	Consumed in Process
Munitions Shop	641	Yes	Yes	Contractor
Operations (Ft Drum Range)	NA	No	No	-
Life Support	610	Yes	No	Consumed in Process
Photo Processing	614	Yes	Yes	Sanitary Sewer
Communication	778	No	No	-
Vehicle Maintenance	620	Yes	Yes	Contractor
Civil Engineering	787	Yes	No	Consumed in Process
Clinic	617	Yes	No	Consumed in Process
108 Tactical Air Command Control Flight				
Vehicle Maintenance	619	Yes	Yes	Contractor
Radar Maintenance	604	Yes	No	Consumed in Process
AGE Shop	604	Yes	Yes	Contractor
Radio Shop	604	Yes	No	Consumed in Process

TSD = Treatment, Storage or Disposal

APPENDIX E

SITE LOCATION MAP

FIGURE E.1



HANCOCK FIELD
SITE LOCATIONS

SOURCE: HANCOCK FIELD INSTALLATION DOCUMENTS

APPENDIX F

HANCOCK FIELD SITE PHOTOGRAPHS

HANCOCK FIELD SITE PHOTOGRAPHS
TABLE OF CONTENTS

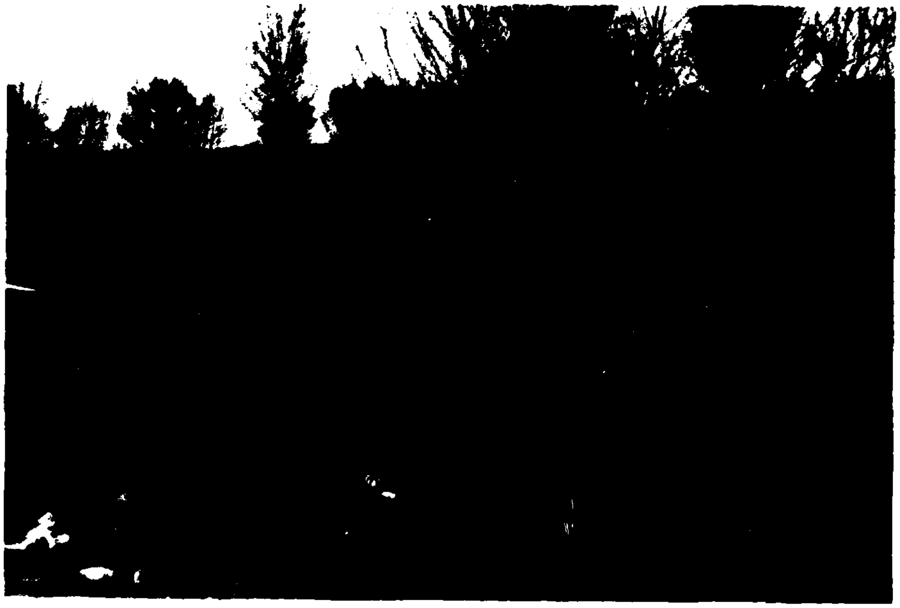
HANCOCK FIELD

Fire Training Site FT-1

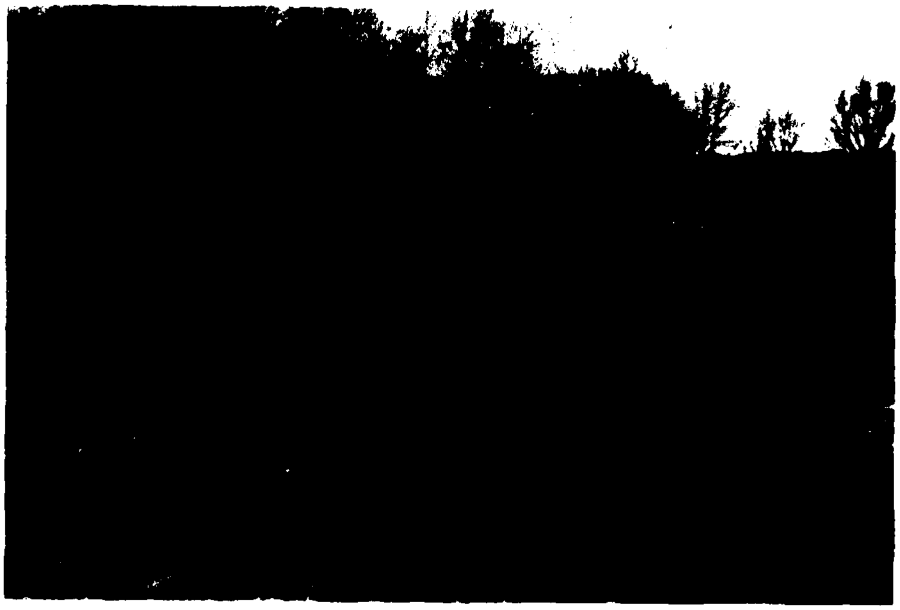
Looking North
across Fire Training Site FT-1

HANCOCK FIELD

Fire Training Site FT-1



Looking North of Fire Training Site
to runoff area



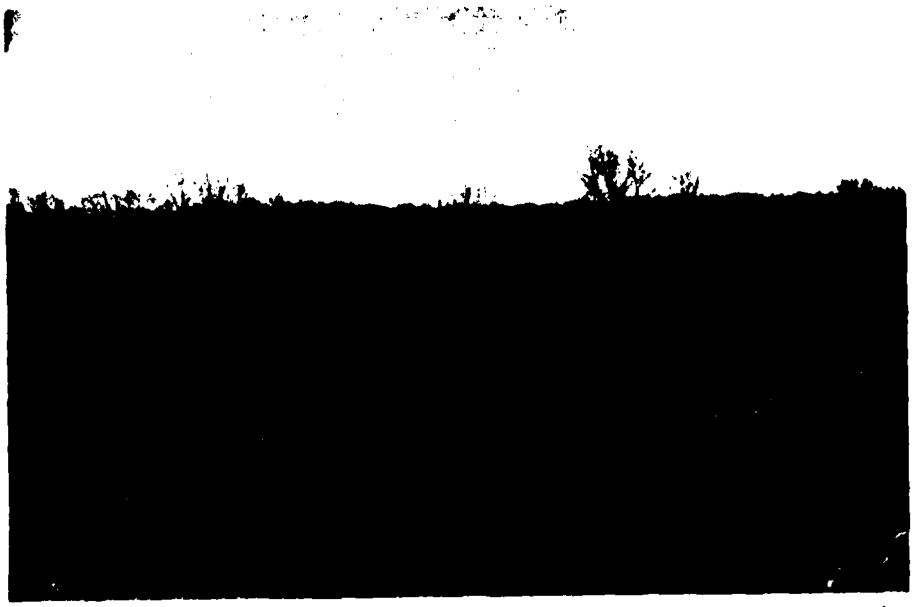
HANCOCK FIELD

Fire Training Site FT-1

Drum storage West of Fire Training Site FT-1

HANCOCK FIELD

Closed Disposal Site D-2
Looking West across the site



Closed Disposal Site D-1
Looking Southeast across the site

HANCOCK FIELD

Disposal Site D-3

Area of Paint Residue Disposal

APPENDIX G

HAZARD ASSESSMENT RATING METHODOLOGY

APPENDIX G

USAF INSTALLATION RESTORATION PROGRAM
HAZARD ASSESSMENT RATING METHODOLOGY

BACKGROUND

The Department of Defense (DOD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DOD facilities. One of the actions required under this program is to:

> "develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts." (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

The first site rating model was developed in June 1981 at a meeting with representatives from USAF Occupational Environmental Health Laboratory (OEHL), Air Force Engineering Services Center (AFESC), Engineering-Science (ES) and CH_2M Hill. The basis for this model was a system developed for EPA by JRB Associates of McLean, Virginia. The JRB model was modified to meet Air Force needs.

After using this model for 6 months at over 20 Air Force installations, certain inadequacies became apparent. Therefore, on January 26 and 27, 1982, representatives of USAF OEHL, AFESC, various major commands, Engineering Science, and CH_2M Hill met to address the inadequacies. The result of the meeting was a new site rating model designed to present a better picture of the hazards posed by sites at Air Force installations. The new rating model described in this presentation is referred to as the Hazard Assessment Rating Methodology.

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air Force in setting priorities for follow-on site investigations and confirmation work under Phase II of IRP.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DOD program needs.

The model uses data readily obtained during the Record Search portion (Phase I) of the IRP. Scoring judgments and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards at the site. This approach meshes well with the policy for evaluating and setting restrictions on excess DOD properties.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: the possible receptors of the contamination, the waste and its characteristics, potential pathways for waste contaminant migration, and any efforts to contain the contaminants. Each of these categories contains a number of rating factors that are used in the overall hazard rating.

The receptors category rating is calculated by scoring each factor, multiplying by a factor weighting constant and adding the weighted scores to obtain a total category score.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned and for direct evidence 100 points are assigned. If no evidence is found, the highest score among three possible routes is used. These routes are surface water migration, flooding, and ground-water migration. Evaluation of each route involves factors associated with the particular migration route. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The scores for each of the three categories are then added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Sites at which there is no containment are not reduced in score. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste managment practices category factor to the sum of the scores for the other three categories.

FIGURE 1

HAZARDOUS ASSESSMENT RATING METHODOLOGY FLOW CHART

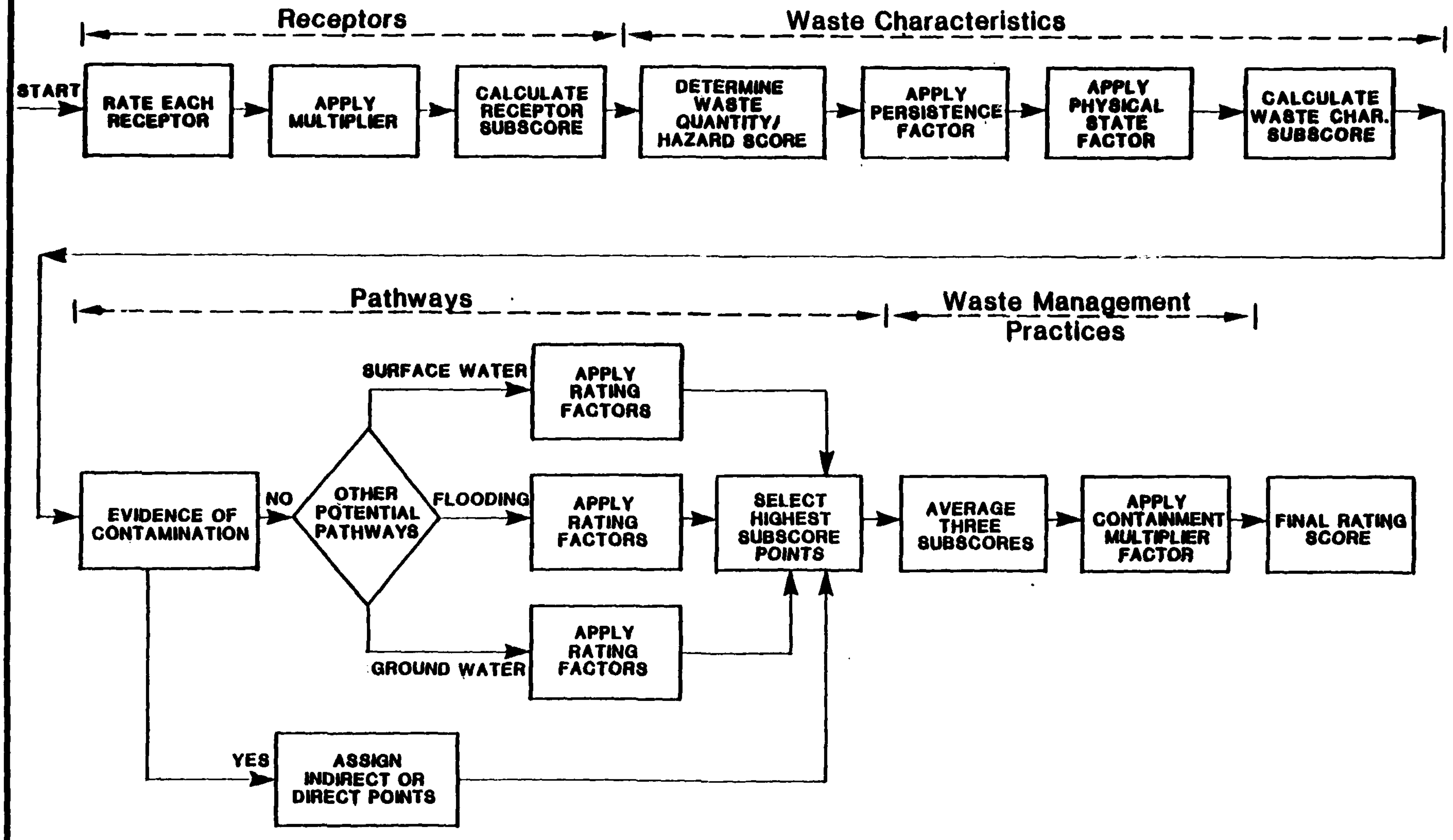


FIGURE 2

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE ____________________

LOCATION ____________________

DATE OF OPERATION OR OCCURRENCE ____________________

OWNER/OPERATOR ____________________

COMMENTS/DESCRIPTION ____________________

SITE RATED BY ____________________

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to reservation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	____	____

Receptors subscore (100 X factor score subtotal/maximum score subtotal) ____

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) ____
2. Confidence level (C = confirmed, S = suspected) ____
3. Hazard rating (H = high, M = medium, L = low) ____

Factor Subscore A (from 20 to 100 based on factor score matrix) ____

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

____ X ____ = ____

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

____ X ____ = ____

FIGURE 2 (Continued)

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore ______

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
		Subtotals	______	______

Subscore (100 X factor score subtotal/maximum score subtotal) ______

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 x factor score/3) ______

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
		Subtotals	______	______

Subscore (100 x factor score subtotal/maximum score subtotal) ______

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore ______

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors ______
Waste Characteristics ______
Pathways ______

Total ______ divided by 3 = ______ Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

______ X ______ = ______

TABLE 1

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES

I. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1 - 25	26 - 100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1 mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential	6
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	3
E. Critical environments (within 1 mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination.	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands.	10
F. Water quality/use designation of nearest surface water body	Agricultural or industrial use.	Recreation, propagation and management of fish and wildlife.	Shellfish propagation and harvesting.	Potable water supplies	6
G. Ground-Water use of uppermost aquifer	Not used, other sources readily available.	Commercial, industrial, or irrigation, very limited other water sources.	Drinking water, municipal water available.	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available.	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1 - 50	51 - 1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1 - 50	51 - 1,000	Greater than 1, 000	6

TABLE 1 (Continued)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (<5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (>20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

- o Verbal reports from interviewer (at least 2) or written information from the records.
- o Knowledge of types and quantities of wastes generated by shops and other areas on base.
- o Based on the above, a determination of the types and quantities of waste disposed of at the site.

S = Suspected confidence level

- o No verbal reports or conflicting verbal reports and no written information from the records.
- o Logic based on a knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site.

A-3 Hazard Rating

Hazard Category	Rating Scale Levels 0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200°F	Flash point at 140°F to 200°F	Flash point at 80°F to 140°F	Flash point less than 80°F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

TABLE 1 (Continued)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

II. WASTE CHARACTERISTICS (Continued)

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	M
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
50	L	S	M
	L	C	L
	M	S	H
	S	C	M
40	S	S	H
	M	S	M
	M	C	L
	L	S	L
30	S	C	L
	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:
Confidence Level
- o Confirmed confidence levels (C) can be added
- o Suspected confidence levels (S) can be added
- o Confirmed confidence levels cannot be added with suspected confidence levels

Waste Hazard Rating
- o Wastes with the same hazard rating can be added
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

TABLE 1 (Continued)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 POTENTIAL FOR SURFACE WATER CONTAMINATION

Rating Factor	Rating Scale Levels: 0	1	2	3	Multiplier
Distance to nearest surface water (includes drainage ditches and storm sewers)	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	Less than -10 in.	-10 to + 5 in.	+5 to +20 in.	Greater than +20 in.	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($<10^{-6}$ cm/sec)	6
Rainfall intensity based on 1 year 24-hr rainfall	<1.0 inch	1.0-2.0 inches	2.1-3.0 inches	>3.0 inches	8
B-2 POTENTIAL FOR FLOODING					
Floodplain	Beyond 100-year floodplain	In 25-year floodplain	In 10-year floodplain	Floods annually	1
B-3 POTENTIAL FOR GROUND-WATER CONTAMINATION					
Depth to ground water	Greater than 500 ft	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	Less than -10 in.	-10 to +5 in.	+5 to +20 in.	Greater than +20 in.	6
Soil permeability	Greater than 50% clay ($>10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($<10^{-2}$ cm/sec)	8
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located below mean ground-water level	8
Direct access to ground water (through faults, fractures, faulty well casings, subsidence fissures, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

TABLE 1 (Continued)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. WASTE MANAGEMENT PRACTICES FACTOR

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Fire Proection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1 or III-B-3, then leave blank for calculation of factor score and maximum possible score.

APPENDIX H

SITE HAZARDOUS ASSESSMENT FORMS

APPENDIX H

TABLE OF CONTENTS

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE FT-1 FIRE TRAINING AREA

LOCATION NEW YORK AIR NATIONAL GUARD

DATE OF OPERATION OR OCCURRENCE 1948 - PRESENT

OWNER/OPERATOR HANCOCK AFB

COMMENTS/DESCRIPTION

SITE RATED BY W. G. CHRISTOPHER

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	0	4	0	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
Subtotals			76	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 42

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) M
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 80

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

80 x 1.0 = 80

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

80 x 1.0 = 80

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 80

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	2	6	12	18
Rainfall intensity	2	8	16	24
Subtotals			64	59

Subscore (100 X factor score subtotal/maximum score subtotal) ____

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	1	8	8	24
Subsurface flows	1	8	8	24
Direct access to ground water	2	8	16	24
Subtotals			68	114

Subscore (100 x factor score subtotal/maximum score subtotal) 60

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 80

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors 42
Waste Characteristics 80
Pathways 80
Total 202 divided by 3 = 67
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

67 x 1.0 = 67

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE D-3 DISPOSAL SITE
LOCATION HANCOCK AFB
DATE OF OPERATION OR OCCURRENCE 1950's - 1979
OWNER/OPERATOR HANCOCK AFB
COMMENTS/DESCRIPTION
SITE RATED BY W. G. CHRISTOPHER

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	88	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 49

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) M
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 50

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

50 x 1.0 = 50

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

50 x 1.0 = 50

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
Subtotals			58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 54

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	2	8	16	24
Direct access to ground water	3	8	24	24
Subtotals			92	114

Subscore (100 x factor score subtotal/maximum score subtotal) 81

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 81

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	49
Waste Characteristics	50
Pathways	81
Total 180 divided by 3 =	60 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

60 x 0.95 = $\boxed{57}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE D-1 DISPOSAL SITE

LOCATION HANCOCK AFB

DATE OF OPERATION OR OCCURRENCE 1950's - 1974

OWNER/OPERATOR HANCOCK AFB

COMMENTS/DESCRIPTION

SITE RATED BY W. G. CHRISTOPHER

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	2	4	8	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	84	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 47

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) M
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 50

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

50 x 1.0 = 50

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

50 x 1.0 = 50

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
Subtotals			50	108

Subscore (100 X factor score subtotal/maximum score subtotal) 46

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	2	8	16	24
Direct access to ground water	3	8	24	24
Subtotals			92	114

Subscore (100 x factor score subtotal/maximum score subtotal) 81

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 81

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors 47
Waste Characteristics 50
Pathways 81

Total 178 divided by 3 = 59
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

59 x 0.95 = 56

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE: D-5 DISPOSAL SITE

LOCATION: NEW YORK AIR NATIONAL GUARD

DATE OF OPERATION OR OCCURRENCE: 1958 - 1976

OWNER/OPERATOR: HANCOCK AFB

COMMENTS/DESCRIPTION:

SITE RATED BY: W. G. CHRISTOPHER

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	2	4	8	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	84	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 47

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 40

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

40 x 1.0 = 40

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

40 x 1.0 = 40

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	2	6	12	18
Rainfall intensity	2	8	16	24
Subtotals			64	108

Subscore (100 X factor score subtotal/maximum score subtotal) 59

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	1	8	8	24
Subsurface flows	3	8	24	24
Direct access to ground water	3	8	24	24
Subtotals			92	114

Subscore (100 x factor score subtotal/maximum score subtotal) 81

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 81

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	47
Waste Characteristics	40
Pathways	81
Total 168 divided by 3 =	56
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

56 x 1.0 = $\boxed{56}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE S-1 TRANSFORMER STORAGE AREA
LOCATION HANCOCK AFB
DATE OF OPERATION OR OCCURRENCE ??? - 1980
OWNER/OPERATOR
COMMENTS/DESCRIPTION W. G. CHRISTOPHER
SITE RATED BY

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	0	4	0	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
Subtotals			76	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 42

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 40

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

40 x 1.0 = 40

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

40 x 1.0 = 40

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
Subtotals			58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 54

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	3	8	24	24
Direct access to ground water	2	8	16	24
Subtotals			92	114

Subscore (100 x factor score subtotal/maximum score subtotal) 81

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 81

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	42
Waste Characteristics	40
Pathways	81
Total 163 divided by 3 =	54
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

54 x 1 = $\boxed{54}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE S-3 ENTOMOLOGY UNDERGROUND STORAGE TANK
LOCATION HANCOCK AFB
DATE OF OPERATION OR OCCURRENCE 1978 - 1980
OWNER/OPERATOR HANCOCK AFB
COMMENTS/DESCRIPTION
SITE RATED BY W.G. CHRISTOPHER

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	88	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 49

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 40

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

40 x 1.0 = 40

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

40 x 1.0 = 40

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	0	8	0	24
Surface permeability	2	6	12	18
Rainfall intensity	2	8	16	24
Subtotals			56	108

Subscore (100 X factor score subtotal/maximum score subtotal) 52

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	1	8	8	24
Subsurface flows	3	8	24	24
Direct access to ground water	2	8	16	24
Subtotals			84	114

Subscore (100 x factor score subtotal/maximum score subtotal) 74

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 74

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	49
Waste Characteristics	40
Pathways	74
Total 163 divided by 3 =	54
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

54 x .95 = 51

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE SP-1 OLD SPILL AREA

LOCATION HANCOCK AFB

DATE OF OPERATION OR OCCURRENCE 1956 - 1973

OWNER/OPERATOR HANCOCK AFB

COMMENTS/DESCRIPTION

SITE RATED BY W. G. CHRISTOPHER

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	3	10	30	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	0	9	0	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	88	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 49

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) L

Factor Subscore A (from 20 to 100 based on factor score matrix) 20

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

20 x 0.8 = 16

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

16 x 1.0 = 16

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 80

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	2	8	16	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	2	8	16	24
		Subtotals	58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 54

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	3	1	3	3

Subscore (100 x factor score/3) 100

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	3	8	24	24
Direct access to ground water	2	8	16	24
		Subtotals	92	114

Subscore (100 x factor score subtotal/maximum score subtotal) 81

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 100

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors 49
Waste Characteristics 16
Pathways 100

Total 165 divided by 3 = 55
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

55 x 0.10 = 6

APPENDIX I

GLOSSARY OF TERMINOLOGY AND ABBREVIATIONS

APPENDIX I
GLOSSARY OF TERMINOLOGY AND ABBREVIATIONS

ADC: Air Defense Command

AF: Air Force

AFB: Air Force Base

AFESC: Air Force Engineering and Services Center

AFFF: Aqueous Film Forming Foam - Fire Control Agent

AFR: Air Force Regulation

AGE: Aerospace Ground Equipment

ALLUVIUM: Unconsolidated sediments deposited in relatively recent geologic time by the action of running water

ANG: Air National Guard

ARTESIAN: Ground water contained under hydrostatic pressure

ARENACEOUS: Sand-bearing or sandy; containing sand-sized particles

AQUEOGLACIAL SEDIMENTS: Sediments deposited by waters associated with the retreat of a continental glacier

AQUIFER: A geologic formation, group of formations, or part of a formation that is capable of yielding water to a well or spring

AVGAS: Aviation Gasoline

BEE: Bioenvironmental Engineering

BIOACCUMULATE: Tendency of elements or compounds to accumulate or build up in the tissues of living organisms when they are exposed to these elements in their environments, e.g., heavy metals

CB: Chlorobromomethane

CE: Civil Engineering

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act

CLOSURE: The completion of a set of rigidly defined functions for a hazardous waste facility no longer in operation

CONFINED AQUIFER: An aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself

CONSOLIDATED UNIT: Typically, igneous, metamorphic sedimentary earthen materials.

CONTAMINATION: The degradation of natural water quality to the extent that its usefulness is impaired; there is no implication of any specific limits since the degree of permissible contamination depends upon the intended end use or uses of the water

D: Disposal site

DDD: 2,2 - bis- (p-Chlorophenyl) - 1,1-dichloro-ethane; a degradation product of DDT.

DDE: 1,1 - dichloro - 2,2-bis (p-Chlorophenyl) ethylene; a degradation product of DDT.

Det: Detachment

DDT: 1,1,1 - Trichloro - 2,2,-bis (p-chlorophenyl) - ethane; a pesticide

DISPOSAL FACILITY: A facility or part of a facility at which hazardous waste is intentionally placed into or on land or water, and at which waste will remain after closure

DISPOSAL OF HAZARDOUS WASTE: The discharge, deposit, injection, dumping, spilling, or placing of any hazardous waste into or on land or water so that such waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground water

D.O.: Dissolved Oxygen

DOD: Department of Defense

DOWNGRADIENT: In the direction of lower hydraulic head; the direction in which ground water flows

DPDO: Defense Property Disposal Office

DUMP: An uncovered land disposal site where solid and/or liquid wastes are deposited with little or no regard for pollution control or aesthetics; dumps are susceptible to open burning and are exposed to the elements, disease, vectors and scavengers

EADC: Eastern Air Defense Command

EFFLUENT: A liquid waste discharge from a manufacturing or treatment process, in its natural state, or partially or completely treated, that discharges into the environment

EPA: Environmental Protection Agency

EROSION: The wearing away of land surface by wind or water

ES: Engineering-Science, Inc.

FACILITY: Any land and appurtenances thereon and thereto used for the treatment, storage and/or disposal of hazardous wastes

FLOOD PLAIN: The lowland and relatively flat areas adjoining inland and coastal areas of the mainland and off-shore islands, including, at a minimum, areas subject to a one percent or greater chance of flooding in any given year

FLOW PATH: The direction or movement of ground water and any contaminants that may be contained therein, as governed principally by the hydraulic gradient

FT: Fire Training

GCA: Ground Controlled Approach

GLACIAL DRIFT: A hydrogeologic unit consisting of glacially deposited, heterogeneous mixtures of sand, silt, clay, gravel cobbles, etc., unstratified and very compact

GROUND WATER: Water beneath the land surface in the saturated zone that is under atmospheric or artesian pressure

GROUND-WATER RESERVOIR: The earth materials and the intervening open spaces that contain ground water

HARDFILL: Disposal sites receiving construction debris, wood, miscellaneous spoil material

HAZARDOUS MATERIAL: A material defined as hazardous under RCRA or CERCLA

HAZARDOUS WASTE: A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed

HAZARDOUS WASTE GENERATION: The act or process of producing a hazardous waste

HEAVY METALS: Metallic elements, including the transition series, which include many elements required for plant and animal nutrition in trace concentrations but which become toxic at higher concentrations

HQ: Headquarters

HWMF: Hazardous Waste Management Facility

HYDROCHEMICAL PROPERTIES: The physical and chemical characteristics of a pollutant that govern its mobility in the ground-water system

ILS: Instrument Landing System

INCOMPATIBLE WASTE: A waste unsuitable for commingling with another waste or material because the commingling might result in generation of extreme heat or pressure, explosion or violent reaction, fire, formation of substances which are shock sensitive, friction sensitive, or otherwise have the potential for reacting violently, formation of toxic dusts, mists, fumes, and gases, volatilization of ignitable or toxic chemicals due to heat generation in such a manner that the likelihood of contamination of ground water or escape of the substance into the environment is increased, any other reaction which might result in not meeting the Air, Human Health, and Environmental Standard

INFILTRATION: The flow of liquid through pores or small openings

IRP: Installation Restoration Program

kg: Kilogram

km: Kilometer

LACUSTRINE DEPOSITS: Accumulation of lake bed sediments

LEACHATE: A solution resulting from the separation or dissolving of soluble or particulate constituents from solid waste or other man-placed medium by movement of water

LEACHING: The process by which materials in the soil, such as nutrients, pesticide chemicals or contaminants, are dissolved and carried away by water

LINER: A continous layer of natural or man-made materials beneath or on the sides of a surface impoundment, landfill, or landfill cell which restricts the downward or lateral escape of hazardous waste, hazardous waste constituents or leachate

mg/l: Milligrams per liter

ml: Milliliter

mm: Millimeter

MGD: Million gallons per day

MONITORING WELL: A well used to measure ground-water levels and to obtain water-quality samples

MSL: Mean Sea Level

NET PRECIPITATION: Annual precipitation minus annual evaporation

NORAD: North American Air Defense Command

NYDEC: New York Department of Environmental Conservation

NYANG: New York Air National Guard

ORGANIC: Being, containing or relating to carbon compounds, especially in which hydrogen is attached to carbon

PCB: Polychlorinated Biphenyls are highly toxic to aquatic life; they persist in the environment for long periods and are biologically accumulative

PENEPLAIN: Surface of regional extent eroded by conventional processes over long time periods to approximately equal elevations.

PERCOLATION: Movement of moisture by gravity or hydrostatic pressure through interstices of unsaturated rock or soil

PD-680: Cleaning solvent, Petroleum distillate

pH: Negative logarithm of hydrogen ion concentration

PHREATIC: Refers to the surface of the saturated zone

PL: Public Law

POL: Petroleum, Oils and Lubricants

POLLUTANT: Any introduced gas, liquid or solid that makes a resource unfit for a specific purpose

PMEL: Precision Maintenance Equipment Laboratory

PS-661: A cleaning agent

RCRA: Resource Conservation and Recovery Act

RECHARGE AREA: An area in which water is absorbed that eventually reaches the zone of saturation in one or more aquifers

RECHARGE: The addition of water to the ground-water system by natural or artificial processes

S: Storage site

SAGE: Semi-Automatic Ground Environment

SANITARY LANDFILL: A land disposal site using an engineered method of disposing solid wastes on land in a way that minimizes environmental hazards

SATURATED ZONE: That part of the earth's crust in which all voids are filled with water

SLUDGE: The solid residue resulting from a manufacturing or wastewater treatment process which also produces a liquid stream

SOLID WASTE: Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community activities, but does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows;

industrial discharges which are point source subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 USC 880); or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954 (68 USC 923)

SP: Spill Area

SPALLING: Loss of strength due to structural disintegration

SPILL: Any unplanned release or discharge of a hazardous waste onto or into the air, land, or water

STORAGE OF HAZARDOUS WASTE: Containment, either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste

TAC: Tactical Air Command

TOC: Total Organic Carbon

TOH: Total Organic Halogen

TYPE LOCALITY: Location at which a formation was originally observed.

TOXICITY: The ability of a material to produce injury or disease upon exposure, ingestion, inhalation, or assimilation by a living organism

TRANSMISSIVITY: The rate at which water is transmitted through a unit width under a unit hydraulic gradient

TREATMENT OF HAZARDOUS WASTE: Any method, technique, or process including neutralization designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize the waste or so as to render the waste nonhazardous

μg/l: Micrograms per liter

UNCONSOLIDATED UNIT: Generally uncemented and unstructured earthen materials

USAF: United States Air Force

WATER TABLE: Surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere

WPC: Water Pollution Control

WT: Waste Treatment Facility

APPENDIX J

REFERENCES

APPENDIX J

REFERENCES

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